THE

WESTERN JOURNAL

OF

MEDICINE AND SURGERY.

JANUARY, 1850.

ART. I.—*A Brief Account of the Epidemic Dysentery, as it occurred in Frankfort and Franklin county, Ky., during the summer and fall of* 1849. By WILLIAM C. SNEED, M. D., of Frankfort, Ky.

The present state of medicine may be viewed, in all its departments, as the result of observation and the record of facts as they have been contributed by the members of the profession in various countries and at various times.

The incentives which have influenced men, in the busy scenes of public life, have had their weight in prompting them to the contribution of these facts. Zeal, in the cultivation of science, and the illustration of truth, has probably as much influence in prompting to enterprize and stimulating the labors of the medical profession, as that of any other; and possibly we would not exceed the limits of truth and justice, were we to say, that no other human

pursuit has been cultivated from motives of purer devotion to the cause of science, nor any sustained by a diligence more laudable, nor directed to more useful ends.—Yet it would be uncandid, and, as we consider, unnecessary, to exclude, altogether, the natural springs of human action from all participation in the motives which have led to the accumulation and display of the various and valuable stores of our profession—its science and resources.

It could not be in the power of any one man, no matter what his opportunities, nor however enlarged his understanding, nor extensive the field of his observation and enquiries, to construct and perfect a scheme of medical science equal to the comprehensive operation which that science effects. To give it scope, efficiency, and, above all, stability, has required, and, for a time to come, will require the concurrent efforts of numerous cultivators, the record of their full investigations, the full interchange of opinions, and the multiplication of facts calculated to fix the principles of the science and regulate their application. Hence the great importance of *keeping* constantly *open* depositories for the record of observations, and even speculations in medicine. In this age, science is not stationary, is defined by no positive bounds, nor restricted within any known limits, and therefore it is the privilege, and the duty of each one to contribute all in his power to aid in its extension and improvement. Thus the labors of many devoted to one end may, like light shining from various points, serve to illuminate the objects of pursuit and enquiry.

Viewed in this light, the contributions of all who aim to promote and advance the important interests of the science, acquire a relative degree of value. And even those who do not hope to instruct the informed, nor aspire to the distinction of giving a new direction to professional opinion, may yet presume to record such facts as come

under their own observations, and modestly present to the profession what has seemed to themselves either of useful application, or curious and interesting.

In this class of contributors the writer is content to take his station, emulous of no greater credit or higher commendation, than to merit the privilege of acting in concert with those of his professional brethren who are endeavoring to improve, adorn, and elevate a profession which contemplates and has accomplished so much for the good of mankind.

The preceding considerations suggest themselves as the proper explanation of the motives which prompt me to offer to the profession the following remarks upon the epidemic that occurred in our town and county during the past summer and fall.

As early as the first of May, cases of diarrhea began to occur and had all the appearance of a mild form of cholera. I was frequently applied to for medical advice in such cases, and invariably relieved them by the use of small doses of calomel and opium repeated in quantity according to the violence of the attacks. The great majority of them yielded to this course of treatment within from one to four days. I found, however, that the patient always did better under the use of these remedies, by remaining in bed, and abstaining from the use of cold drinks and solid food. One of the first injunctions which I placed upon my patients was to go to bed and remain there as quiet as possible, until the bowels were entirely relieved from pain or uneasiness, and until good bilious operations were obtained. There was a peculiar symptom, attending all these cases, which I have never met with in diarrhea before. It was a peculiar and indescribable uneasiness about the bowels. The patients would express themselves as feeling as though the whole of the abdominal viscera had been torn loose and were floating in the cavity. When they would turn over in bed, or get

up, it would seem as though the peritoneal sack was full of water and the viscera were floating loose in it. There was rarely ever any nausea or vomiting, but on the contrary the appetite was good and the amount of thirst not very great. In all these cases the tongue was very white, flabby, and moist. Fever rarely or never attended, and the patients would express themselves as feeling well except the loose and peculiar sensation of the bowels. The strength of the system became speedily affected, and in a few hours such a degree of prostration followed that it was with difficulty that the patient could walk about.

These cases continued to occur until about the first of June, when they assumed a rather more grave form.—The weather about this time was warm and wet—showers falling almost daily, and the heat of the sun during the day very oppressive. During the month of June, diarrhea continued to prevail, but yielded to the usual mode of treatment—not, however, so readily as previously. A few very violent cases of cholera morbus occurred in the town and county during the month, brought on mainly by the improper use of fruit and vegetables. No death occurred, however, within my knowledge, and the course of treatment mentioned previously was pursued. Early in the month of July, a few *indigenous* cases of cholera appeared in the town and proved fatal in one or two instances. The weather still continued wet and warm, and in every way favorable to the production of such cases. Up to this time no well marked case of dysentery or flux had occurred, but cases of diarrhea increased in numbers and violence, and the cases had to be met very promptly to prevent them from running into cholera of the worst form.

The first well marked cases of flux which came under my notice occurred about the third of July; one of them was a delicate female who had been delivered a few days previously and had imprudently indulged in the use of vegetables. Her case was one of great violence, and for a

while put all remedies at defiance. She, however, contrary to my expectations, recovered, after having gone through a protracted course of treatment. The next case was that of one of our most useful and respectable citizens. He had been superintendent of our gas and water works, and had worked a great deal in lead, which I incline to think, had, to some extent, deranged his system and made him much more susceptible to the epidemic influence than he otherwise would have been. His case was one of great violence, and proved fatal after *over* sixty days of great suffering. I think he would have recovered, but for an accidental hemorrhage of the bowels which occurred after he had apparently nearly recovered from the epidemic.

From this time [3d of July] the epidemic increased in violence, and by the middle of the month was in almost every part of the town and county.

The disease now under consideration commenced, in many cases, with much the appearance of the diarrhea which preceded it; frequent and unseasonable calls to stool, attended with straining and tenesmus. The evacuations were generally copious at first, of a fluid character, and in some cases of a peculiar fetid smell; some times containing streaks of blood, and at other times blood in small quantities, unmixed with fecal matter.—The pulse in the early stage was seldom altered; the heat of the skin not much increased, and the tongue in many cases but little changed in its appearance. There was, in some cases, great prostration of strength and depression of spirits, the appetite indifferent and the thirst very urgent. After this train of symptoms had prevailed for a few days, there would be a fixed pain in the hypogastrium, more or less acute; the pain extending to the iliac regions, and more or less urgent along the whole course of the colon, with fullness, tension, and tenderness upon pressure. The evacuations, as these symptoms increas-

ed, become more frequent and less copious, consisting of blood and mucus, or bloody serum, resembling water in which fresh beef had been washed. Tenesmus, with suppression of urine, now would become distressing symptoms, and the patient cared for nothing but cold drinks, with which it was impossible to satisfy his desires. The tongue became white and furred, with a tremulous motion when protruded from the mouth. The skin during the violent symptoms now existing, would be hot and dry, or covered with a profuse warm perspiration: the latter was invariably a favorable symptom. The pulse varied according to the violence of the foregoing symptoms. In some it would assume a febrile quickness, without any other distinct feature; in others it would be full, with a peculiar jerk or rythm, which indicated more violence in the attack than the former alteration. In the fatal cases the symptoms would increase in violence from day to day until death closed the scene, which usually occurred in the course of from twelve to twenty days. I have known some patients to have from twenty to forty evacuations in the twenty-four hours, which, in quantity, would be almost incredible, and of a character differing from anything of the kind I ever saw.

The period of convalescence varied very greatly; some cases recovering in a very few days, while others were protracted for weeks, and some for months. When the disease passed into the chronic form, it differed but little, if any, from ordinary sporadic dysentery in the same stage. Ulceration of the large bowels, I have no doubt, often occurred, and was the main cause of the difficulty in conducting such cases to a favorable termination. I had only one opportunity of making an inspection of the lesion produced by the disease, and that afforded but little satisfaction as to the precise condition of the parts involved. The subject was a convict, who died of a relapse, after having apparently recovered from an ordina-

ry attack. Inspection after death showed thickening and chronic ulceration of the lower bowel up to the sygmoid flexure; above that, to the cecum, there was acute inflammation of a mild grade, and in the small bowel, for a space of six or eight feet, complete hyperemia.—The mucous coat of the bowels was as red as scarlet, but neither softened nor ulcerated. His symptoms, during his last illness, were those of congestion, and I suppose that this condition of the small bowel was the cause of his death. On his return to the hospital, he had but little of the dysenteric character in his case. His skin was cold and moist; his pulse feeble and soft; countenance restless and cadaveric; extremities cold; no pain or tenderness about the bowels, and no tympanitis. Counter-irritants, diffusible and permanent stimulants, mercurials, &c., were all successively tried, but failed to afford relief, and he succumbed in a few days.

Several other cases of nearly the same character as the foregoing came under my notice, all of which proved fatal. I have no doubt but the scalpel would have revealed the same condition of the parts as above detailed.

The proximate cause of the disease I supposed to be the same—modified in some way—which produced the diarrhea and cholera which preceded and accompanied it. The state of the atmosphere differed in no appreciable manner from other wet and warm seasons. There was nothing either in the town or county, or about any of the locations where it prevailed to the greatest extent, to which its prevalence could be attributed. Those persons who were the most prudent in their diet were no more exempt from attacks than the most imprudent. It attacked persons of all ages, of all temperaments, and all conditions of life, with equal violence. Two functions seemed to be invariably involved, viz: the skin and the liver. My own views in relation to the pathology of the disease may be briefly stated *to be portal congestion, with a pecu-*

liar tendency to inflammation of the lower or large bowel. How or what way this derangement is produced, I know not, nor do I think it worth the trouble to advance any speculations on the subject in this paper.

A brief detail of the principal medical applications used in the treatment of this disease must close what I have to say upon the subject. Under their proper heads I have attempted to detail my experience in the use of the remedies which I resorted to.

Bloodletting.—This remedy was never tested by me, for the simple reason that I did not sufficiently understand the nature of the epidemic to risk a remedy of such potency. After a careful review of my cases, I am still unable to say what effect would probably have resulted from its use. I am satisfied, however, that in many cases it would have been wholly inadmissible, while in many others, it would have been of doubtful utility.

Mercurials.—The combination of calomel and opium having produced such marked and happy effects in the treatment of the diarrhea which preceded the flux, it was perfectly natural that we should resort to its use in the first cases of flux that occurred. There is, and ever has been (according to the books), a great variety of opinion in regard to the use of these medicines in this disease. According to the writers on tropical dysentery, calomel, in combination with opium, conjoined with diaphoretics, is the sheet anchor in the treatment of this disease. In warm climates, and where there is great hepatic derangement, there can be no question of the great efficiency of calomel, but in this and milder climates it is not so much relied on. I am not fully prepared to give an opinion on its virtues now, after having had such an extensive opportunity of testing it. In sporadic dysentery I have found it, with opium, equal to any other remedy. In some of the cases that came under my care, it acted like a charm, and when carried to ptyalism, produced a speedy and permanent cure.

In the penitentiary in this place there occurred, during the summer, about seventy cases of this disease, all of which recovered but one, and that was a relapsed and neglected case—and they were treated entirely with calomel, alone or compounded with opium. Here the ordinary treatment of sporadic dysentery succeeded to admiration—the patients recovering rapidly and permanently, though the attacks in many cases were violent and alarming.

In private practice the same course of treatment failed to meet my expectations. I do not recollect of more than eight or ten patients who were benefitted by being subjected to the constitutional effects of this remedy. In a few it acted well, but in others it seemed rather to provoke than mitigate the disease.

Opium.—This remedy has been so highly applauded by medical writers on dysentery, that it would be considered presumption to say aught against its use, at this time. I suppose it is the abuse of the article which has given rise to a prejudice against its use in my own and in the minds of others. I have tried it repeatedly, as recommended by Christison and others, and have invariably been disappointed in its effects. In my first use of it, during the prevalence of the epidemic just past, I am satisfied that it was the cause of incalculable injuries to my patients. It failed to give relief to the tenesmus and pain, and I believe seriously impeded the spontaneous efforts of the system to throw off the disease. When combined with ipecac and calomel, in small doses, its effects were beneficial, and particularly so when I gave it in small doses, frequently repeated, after the bowels had been well evacuated. The form which I preferred was that of Dover's powder and sulphate of morphine, with pulv. ipecac. The acidulated tincture, with acetate of lead, was used in cases unattended by fever or pain, and had often a good effect in lessening the frequency of the operations.

Injections.—From the great importance attached to this remedy by medical writers, I was educated to believe them of great utility in this disease. Having found them either inefficient or hurtful, I soon discontinued their use, except in some peculiar cases. With most patients, the introduction of the pipe more than counterbalanced the soothing effect of the injection. I have rarely seen the injection retained more than a few minutes, no matter how small in volume it might be—and when passed off, was attended invariably by tenesmus and straining. At the suggestion of Dr. Drake, I used in the latter part of the season injections composed of cold ice-water, with sugar of lead, and found that they afforded more relief than any other form I had used. As a substitute, I used in some cases opium suppositories with benefit, but I found more good to result from the use of warm fomentations to the parts, or bladders filled with hot water applied to the hypogastric region. The soothing effects produced by these applications were soon acknowledged by the patients, and often followed by sweet repose of considerable duration.

Mustard plasters to the sacrum, followed by warm poultices had a very soothing effect in some cases.

Blisters.—I used blisters to the abdomen in a few cases but found little or no good to result from them. They were objectionable on several accounts, besides the pain which they produced when the patient would have to use the chamber vessel, they were often very annoying in consequence of the stranguary caused by the absorption of the essential oil. Micturition was almost invariably difficult and painful in consequence of the irritation of the rectum, extending to the neck of the bladder, and when this part was subjected to any additional irritation, the pain was almost insupportable. Pustulation with ung. tart. ant. or croton oil over the hypogastric region seemed to be beneficial in some chronic cases.

Local bloodletting, by the use of cups and leeches, seemed to have little or no influence in checking the disease, and was but seldom used.

The plan of treatment which proved most successful was about as follows: when called to a case of well marked flux, I first gave a dose composed of calomel, ipecac and rhubarb, in quantity proportioned to the age and constitution of the patient. After this had acted well upon the bowels, emptying them of all crudities and feculent accumulations, I gave an anodyne, composed of pulv. Doveri or morphine and pulv. ipecac. This I would repeat two or three times at intervals of four or six hours, and at the expiration of the first twenty-four or thirty hours, I would give another purgative dose of the same composition as the first, and repeat in six hours unless free bilious discharges were produced. When the bowels were well emptied and the liver sufficiently acted upon, I would repeat the anodyne until tenesmus, tormina, and all other unpleasant symptoms were either suspended or mitigated. I found that the pulv. ipecac, combined with the purgative and sedative in large quantities, would be well borne, and had a powerful effect in determining to the surface, which was always a desirable object to be obtained. I may here remark that no case of mine proved fatal, where the skin could be sufficiently acted upon. I was always prepared to give a favorable prognosis when this function could be properly excited. If the discharges still persisted, and the tenesmus and tormina continued to be distressing, I gave, with decided good effects, "Hope's Mixture." In my first use of this remedy, I was disappointed, but by increasing the quantity of the opium, and adding about one-fifth or sixth of wine of ipecac. to the mixture, I found the most decided good effects to result from its use. To adult patients I gave a table-spoonful every hour, until its good effects were produced. With some it would be extremely grateful, qui-

eting the stomach, relieving the pain and tenesmus in the large bowel, and acting upon the skin in a most happy manner. Its effect upon the liver in many cases was well marked, but in most cases its principle action was to the skin. In the latter stages of an attack, I occasionally gave astringents, both by the mouth and by enemas, but I placed but little reliance on their use. Where there was great prostration, with general debility, in the latter stages, tonics were used with good effect—the best of which were quinine, combined with pulv. Doveri or morphine, and good Port or Madeira wine. I used, in some cases, salts and laudanum combined, after the plan recommended in the books, but I found no good results from their use, which were not more speedily obtained by the plan above detailed. I might give additional interest to this paper by detailing at length some of the most interesting cases that c me under my treatment, but as my object is to be brief, I must decline further details.

Relapses were not frequent, but always dangerous, and oftener occurred from imprudence in eating than from all other causes. It was found best in all cases to keep the patient, from the beginning of his attack to its close on mild articles of food, and not permit the use of cold drinks of any kind. Ice water and every other cold drink had a decided tendency to aggravate the disease, without affording the patient the least comfort, even for the moment while partaking of them.

I have, in this paper, aimed at nothing but a faithful detail of the facts and observations which presented themselves during the epidemic; and submit them, with the request that you make any use of them which may seem to you proper, or best for the good of the profession.

Frankfort, December 1, 1849.

ART. II.—*Cases of Purpura.* By B. F. WENDEL, M. D., one of the Physicians to Emigrants' Hospital, Ward's Island, N. Y.

Michael Mushaul, æt. nine years, from Ireland, came into my ward on the 21st of October.

At that time he was suffering from a slight attack of dysentery, which he had had four days—his discharges being nearly pure blood. He was treated with Dover's powder and minute doses of calomel during the two following days, during which the discharges assumed a more healthy character—after which Dover's powder alone was administered.

By the 29th, he was out of bed, and playing with the other boys.

He seemed improving in health, until Nov. 4th, on the morning of which I noticed him looking pale, and seemingly disinclined to eat or stir about. In a few hours he was very pale, with a feeble pulse and cool skin, and he was immediately ordered carbonate of ammonia.

Nov. 5. He is deathly pale; his pulse still weaker, despite the ammonia, and skin very cool; and just before twelve o'clock, A. M., he began to purge and vomit a dark colored semi-coagulated blood. Ammonia was continued, and the vomiting and purging relieved by small doses of turpentine.

On the 6th and 7th, he was decidedly better; had some appetite; paid attention to what was going on around him, and said he was better; he purged and vomited occasionally, but this was checked by lead and opium.

On the evening of the 7th, he was decidedly improved.

On the 8th, he was paler and weaker than at any time previous; pulse frequent and gaseous, and the skin very cool. Carb. ammonia, milk punch and beef tea were given freely. At 11, A. M., he passed a considerable quantity of bloody urine, which he continued to do until

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his death, but at this time the vomiting and purging of blood was small.

There was no improvement in him during the day, and in the course of the night hemorrhagic spots showed themselves more or less over the whole body, and from the time of their appearance there was a complete cessation of either vomiting or purging, though, as before remarked, bloody urine continued to be passed.

On the morning of the 9th, he was perfectly sensible, answering questions promptly and calling for what he wished; he had, however, an inexpressive look; took but little notice of what was doing; his breathing was natural, skin quite cool, pupils slightly dilated and pulse extremely weak. He was then ordered three drops of nitro-muriatic acid every four hours, carb. ammonia and the most nourishing diet to be continued, which treatment was adhered to to the end of his life.

He continued to grow worse, and on the 13th, the day of his death, he complained of pain in the abdomen, which was tender to the touch, and tossed his head from side to side.

The breathing continued natural; the pupils slightly dilated, and pulse frequent and without force.

At 11 o'clock, A. M. he died.

For an account of the pathological appearances on dissection of this and the following case I am indebted to my friend and co-laborer, Dr. Lidell, who, with Dr. Tellkampf, physician in chief of this hospital, and Mr. Ely, was present at both examinations.

Autopsy, twenty-eight hours after death.—Body pale; considerably emaciated, with hemorrhagic spots ranging in size from a pin's head to a split pea (few larger), scattered over its surface, most abundant about the ankles and legs. Each spot has a well defined margin, and some form perfect rings, with a hair follicle in the centre, unaffected by discoloration. On being cut through, these

spots are found to be produced by blood effused into the skin and cellular tissue beneath, sometimes to a considerable depth. Brain contains less blood than usual, which is thin and pale; small quantity of bloody serum in the lateral ventricles. Thorax—Pleura adherent on both sides; about twelve ounces of bloody serum were present in the plural cavity on each side. Lungs emphysematous and containing less blood than usual; contain also numerous dark colored spots of effused blood, about the size of a pea scattered through their substance. A mass of tuberculous deposit, larger than a hickory nut, lies near the base of the upper lobe of the left lung, just beneath the pleura. Fibrin has been effused around it, which has become organized, contracted, and presents the appearance of a genuine cicatrix, far advanced in the process of formation; the tuberculous mass is softening in its interior. No other tubercles present. A few spots of blood were effused into the sub-mucous tissue of the trachea and larynx. Muscular tissue of the heart much paler than natural, (almost as pale as after maceration); hemorrhagic spots scattered throughout its substance, most abundant in the left auricles; spots of effusion on the mitral valve; heart clots very small and the blood contained in the heart thin and pale. Liver very pale.—Gall-bladder half filled with yellowish bile. Spleen small, flattened and softened. A few hemorrhagic spots under parietal peritoneum on the right side. Kidneys—Lining membrane of the pelvis of each kidney completely blackened by effused blood; bloody fluid present in the cavity of the pelvis of each kidney. The vascular and tubular structure of both organs paler than usual. Stomach—Splenic third, embracing cardial orifice, blue-black in color, coated with viscid mucus; mucous membrane thickened and softened; middle third lying mainly on the greater curvature, uniformly dark brown in color, with bright red spots as large as a pin head scattered over its sur-

face; mucous membrane thickened; pyloric third healthy. Each of these thirds is separated from the other by a distinct line of demarkation. Intestines contain a considerable quantity of blackish semifluid matter. Rectum and colon, quite up to the ileo-cecal valve, blue black in color (gangrene not present), with the ulcerations and thickenings of old dysentery and small recent dysenteric ulcerations. Large intestines appear exactly as if they had been macerated in water. Small intestines—Peyer's plates unusually distinct; small, dark colored spots scattered through the small intestines apparently analagous to the purpuric spots on the external surface of the body. Otherwise healthy. The blood throughout the body is uniformly more thin, fluid and pale than usual. Other organs healthy.

The following case, with accompanying remarks, was kindly furnished me, by Dr. Lidell, before alluded to, one of the assistant physicians of Bellevue Hospital, New York.

Catherine ———, spinster, aged twenty-two, born in New York, admitted to Bellevue Hospital, Friday, September 29th, at 10½, A. M.

Says that her health has usually been good, but last winter had a severe attack of rheumatism. Has been, for some time past, given up to licentious and intemperate habits.

On the evening of Monday, the 25th, had a severe chill, with intense pain in the small of the back and head, heat, thirst and restlessness. These febrile symptoms continued till the night previous to admission, when she had profuse nasal hemorrhage. On the morning of the 29th, (day of admission,) at about seven o'clock, *a breaking out*, as the patient called it, suddenly appeared, scattered over the whole surface of the body. This was attended by great and immediate relief from pain.

Sept. 29th, 11, A. M.—Patient has been in hospital

about one half hour. Presents a most remarkable appearance. Her whole body exhibits patches of purpuric spots almost confluent, varying in size from the palm of hand to a half dime, most abundant about face, neck and chest; a bright red eruption, disappearing under pressure, occupies the spaces between purpuric patches, on face, breast, arms, legs, etc.; conjunctiva appear as if completely ecchymosed; eyes watery, with some defluxion from nostrils; skin dry and hot; pulse about ninety and quick; has thirst and restlessness; tongue moist and lightly coated with a whitish fur; roof of mouth covered with a whitish exudation; complains of sore throat, with considerable dysphagia; slight dyspnea; bowels had been open during the previous night. Ordered acidulated drinks to be taken freely, rest and suitable diet.

Sept. 29, 5, P. M.—Purpuric patches somewhat more confluent, particularly on face; skin hotter; pulse fuller; has sanious sputa; had, during afternoon, slight epistaxis; dyspnea increased. Same treatment continued, with addition of tepid sponging.

Sept. 30th, 9, A. M.—Patient had considerable epistaxis during night; passed two or three ounces of blood in stool; slept very little; pulse one hundred and twenty; respirations sixty; sanious sputa; complains of increased soreness of throat, and consequent increased difficulty in swallowing; tongue moist and covered with brownish fur; three or four big drops of sanious exudation, closely resembling "bloody sweat," stand on forehead and right side of nose; erythematous blush has faded somewhat.

Sept. 30th, 1, P. M.—Pulse and respiration about the same as at last visit; has low delirium, from which she is easily roused; increase of bloody sweat; purpuric patches continue to become more confluent. Ordered sulph. acid aromat. gtt. x, every second hour.

Sept. 30th, 7, P. M.—Pulse one hundred and thirty-five, small and feeble; respirations more frequent, short and

anxious; delirium still of low, muttering character, from which she can now scarcely be roused; bowels have been open three or four times since morning; stools small, blackish, and very fetid; considerable bloody sweat stands on forehead and cheeks; power of deglutition nearly gone; at no time since her admission has she passed blood in urine; continued to grow worse, and died about ten the same evening.

Autopsy, twelve hours after death.—Embonpoint preserved. Whole surface of body blackened with confluent purpuric patches. Head—somewhat congested, otherwise natural. Respiratory organs—larynx and trachea thickly spotted with blood effused under mucous coat.—Lungs—middle third, and part of lower third of each lung, partially solidified by coagulated blood effused into the cellular tissue. These parts still contained some air. Rest of each lung much congested, and giving out bloody fluid on pressure. Heart—natural. Esophagus and stomach—completely blackened by confluent spots of effused blood into submucous tissue. These spots became less abundant in the small intestine, but were again found in great numbers in the large intestine, quite down to anus. Liver—nearly double the normal size, and exhibited the fatty degeneration. Kidneys—right, somewhat enlarged, with commencing fatty degeneration; a considerable effusion of blood into cellular tissue investing the organ, and also one large and numerous small spots under lining membrane of pelvis. Left kidney, in structure healthy, but presenting similar spots of effusion. Spleen—softened. Other organs healthy.

Bellevue Hospital, Oct. 26, 1848.

"*Remarks.*—The foregoing is a very interesting example of one of the most obscure diseases to which man is liable. The almost universal hemorrhagic condition, and its rapidly fatal result, connected with the habits of the patient, and the postmortem appearances, render it one

well worthy of record. The real pathology of purpura is involved in mystery; some regarding it as a mere variety of scurvy, others as a distinct disease, and others again as only a symptom or a consequence of other diseases which had impaired the constitution of the patient. This latter opinion is undoubtedly nearest the truth; the peculiar hemorrhagic condition being the result of an altered condition of the blood. Hence the treatment must be guided by the previous condition of the system in each individual case. But we have never noticed a case in which the purpuric spots were so extensive, both in the cutaneous and mucous surfaces, and which proved so rapidly fatal as the one detailed above."

Patrick Gill, from Ireland, an unhealthy looking boy, aged six years, of whose previous history nothing is known, I saw in the nursery on Nov. 7th, with the signs of acute thoracic inflammation—pungent heat of skin, flushed face, frequent and rather incompressible pulse, dyspnea, dilatation of the nostrils at each inspiration, pain in chest, &c. He was immediately sent to hospital, and put on nitrate of potassa and ipecac. in minute doses frequently repeated. In the evening he was no better. Same treatment continued.

Nov. 8th. Finding no abatement of the symptoms, a vein in the arm was opened, but no blood escaped at the time, and it was left unclosed until evening, during which time he lost a few ounces of blood. The nit. potassa and ipecac were continued.

In the evening he was decidedly better.

By the 10th, nothing remained but a slight bronchitis.

At my first visit, he looked rather drowsy, but showed no other symptoms of any affection of the nervous centers.

Nov. 12th. He looks quite drowsy; sleeps with his eyes half open; pupils slightly dilated; notices nothing; bawls out in sleep; respiration natural and pulse frequent, but

of no volume. He would cry and make resistance on attempting to move him. These symptoms became more developed, so that he made obstinate resistance when even touched or moved; would not put out his tongue, and was calling out in his sleep "every hour." The alvine discharges were natural, as also the urine. He did not toss about in bed, nor was there from first to last any signs of convulsive action. I had a blister put to the back of his neck, and gave him calomel.

Nov. 14th. Frothy blood filled his mouth so that the tongue was not seen. Skin cool; pulse diminished in force; pupils slightly dilated; breathing slow and laborious. On the evening of this day, purpuric spots appeared on him, and at night he died.

Autopsy, fifteen hours after death.—Body emaciated, of a yellowish color, somewhat tinged with green. A few purpuric spots on legs and left hip, of considerable size and without a well defined margin. When cut into, blood is found effused in the skin and cellular tissue beneath, to a considerable depth. Right pupil a little more dilated than the left. Brain paler than usual; blood contained in its vessels is thin and watery. On the upper surface of the middle lobe of the right hemisphere is a flattened recent clot of blood, which, when gathered into a mass, is as large as a filbert. At the corresponding point on the left hemisphere is another clot much smaller in size. Also on the posterior surface of the posterior of the right hemisphere, is a small, flat and recent clot. A sanguineous effusion at base of brain. The clots are all lying in the cavity of the arachnoid. No other morbid appearances.

Lungs emphysematous, contain rather more blood than usual, which is thin and watery. Brown spots, as large as a pea, produced by blood effused into the cellular and vesicular structure scattered through the substance of the lungs. Bloody fluid, mixed with air, given out under

pressure. Bronchials inflamed. A small quantity of bloody serum in the cavity of the pleura on each side.

Pericardium contains a small quantity of bloody serum.

Heart—Muscular tissue paler than natural; a few hemorrhagic spots in the valves and fleshy columns of the left ventricle. Heart clots very small.

Blood throughout the body thinner and paler than usual.

Liver paler than natural, though it contains a normal quantity of blood. Gall bladder filled with green bile.

Spleen enlarged, softened and full of blood, presenting internally a dark brown rotten appearance.

Kidneys paler than usual; right contains rather more than a normal quantity of blood, thin and pale. Otherwise healthy.

Stomach has a few punctiform hemorrhagic spots scattered over fundus and along greater curvature; pyloric portion congested. Esophagus intensely inflamed and congested to the extent of two or three inches above the cardiac orifice of stomach. Large intestine is blue-black in color, but is not gangrenous. Peyer's plates are unusually distinct. The mucous membrane of the stomach and intestines is softened throughout. At the termination of the upper third of the ileum there is an intussusception (invagination) from above downwards to the extent of one and a half inches. No inflammation of the parts implicated—simple congestion. Pancreas enlarged. Other organs healthy.

There is another case of purpura hemorrhagica in my ward, occurring in the person of a boy about five years old. The spots are but few in number, and are on the lower part of the abdomen and thighs. They have a well defined margin, and showed themselves after he had labored under a slight diarrhea, for which he was admitted, of three days continuance. He is fast recovering, under the antiscorbutic treatment of vinegar with scraped Irish potatoes.

ART. III.—*A Brief Sketch of the Life, Character, and Writings of William Charles Wells, M. D., F. R. S., &c., &c.* An Address delivered before the Louisville Medical Society, December 7th, 1849. By ELISHA BARTLETT, M. D., Professor of the Theory and Practice of Medicine, in the University of Louisville, Ky.

In the Introductory Address to the Medical class, which I had the pleasure of making, a few weeks ago, I took occasion to speak of the pleasures and the benefits which the practical physician might derive, from the cultivation of studies and tastes not immediately and exclusively connected with his own occupation. I expressed the opinion, that a reasonable devotion to these studies, and a reasonable indulgence in these tastes, would not only improve the character, and augment the sum of his happiness, by calling into exercise the finest and noblest powers of his mind; but that he might, also, thereby be rendered a more successful and accomplished practitioner of his art; that he might thus be made, not only a wiser and a better man, but a more skilful physician. Amongst the studies which I then particularly enumerated, and nearest allied of them all, to his practical duties, was the history and the literature of his own science and art; and so much, especially, of this history and literature as are contained in the written lives of the most distinguished cultivators of medical science. I do not know any more agreeable study than that of biography; and although the annals of our own science, when compared with those of politics, general literature, belles-letters, and the arts, cannot be said to be rich in this species of composition, they are still sufficiently so to furnish a fertile source of instruction and delight. I propose to occupy the time which you have assigned to me, on the present occasion, with a short history of the life and the labors, and with such a delineation and estimate of the character, as the study of this life and these labors will enable me to make,

of an individual, less known, I am sure, than he deserves to be, especially to American physicians :—I mean William Charles Wells.

And I take up this subject, not as a piece of irksome drudgery, but as a labor of love. I had just finished reading, when I prepared this sketch, for the first time, the volume which contains the record of his life and the results of his labors; and my mind had been so interested and my feelings so warmed by its perusal, that the business before me became a pleasure, and not a task. I cannot doubt that I shall awaken in your bosoms emotions and sentiments corresponding in some degree to those which have been kindled in mine.

Dr. Wells was an American. He was born in Charleston, South Carolina, in May, 1757. His parents were both natives of Scotland. His father, who was a good general scholar, having been unsuccessful in some mercantile scheme, in Charleston, set up the business of a bookseller and bookbinder; he also printed a newspaper. He was a zealous and uncompromising tory; and he took great pains, and this with entire success, to educate his son William in the same political faith.

The son was sent to a grammar-school, in Dumfries, Scotland, before he was eleven years old, where he remained for nearly two years and a half. From Dumfries he was sent to Edinburgh, in the autumn of 1770, where he attended several of the lower classes of the University, and where he also learned drawing. He returned to his native town in 1771, and soon afterwards commenced the study of medicine, with Dr. Alexander Garden, the principal physician of Charleston; with whom he remained, a diligent student, for more than three years. The revolutionary contest between the American colonies and Great Britain had then fairly commenced; young Wells's father had already been obliged, on account of his political principles, to leave the country; and the son, himself,

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for similar reasons, soon after followed him. He arrived in England in the autumn of 1775; and, in the beginning of the following winter, commenced his regular medical studies at Edinburgh. In the autumn of 1778, he visited London, attended a course of Dr. William Hunter's lectures, and took instructions in practical anatomy. He was now appointed surgeon to a Scotch regiment in the service of Holland. He embarked for the Hague to take possession of his post early in 1779; but, soon after, becoming involved in some personal difficulties with the colonel of his regiment, he resigned his commission, and was discharged from the service. Immediately afterwards, in the beginning of 1780, he went to Leyden, where he spent three months, mostly occupied in the composition of his Thesis. In the autumn of the same year, he received at Edinburgh his degree of Doctor in Medicine.

In consequence of the deranged state of his father's concerns, in Charleston, growing out of the revolutionary war, he again visited this country, in the beginning of the year 1781. Charleston was at this time in the possession of the king's troops; but in December, 1782, in consequence of the evacuation of the garrison, Dr. Wells removed to St. Augustine, in East Florida, taking with him a printing press and types. He there commenced a weekly newspaper; and became, also, captain to a body of volunteers, raised for the purpose of resisting some threatened attacks of the Americans. The preliminaries of peace between the two countries having been signed, Dr. Wells returned to Charleston; and immediately on his arrival, was arrested on a private suit, originating in a transaction of his brother's, and committed to prison, where he remained upwards of three months. As soon as he succeeded in procuring his release, he again left for St. Augustine, and very narrowly escaped death by the wreck of his vessel, on the passage thither. In the sum-

mer of 1784, he returned to London, preparatory to his settlement in that city; where, after spending three months, in the spring of 1785, in Paris, in the words of his own sketch of his life, he had the name of Dr. Wells affixed upon the door of a lodging which he had hired. His father's property had now almost entirely disappeared, and he was obliged to borrow £130 from one of his friends, to enable him to commence his career, as a London physician. This career proved anything but prosperous. For several years he hardly took a single fee—and it was ten years, before his income from every source, including an annual gratuity of £50 from the Finsbury Dispensary, to which he had been appointed one of the physicians, reached the sum of £250 per annum; and during this period he had been obliged to increase his debt to about £600. In 1795, his professional receipts became equal to his moderate expenditures, and in the next five years he succeeded in paying off a small portion of his debt. From 1801 to 1812, his income fluctuated between £235 and £455; and, from regular fees alone it never reached £600. He finally paid the whole amount of his debt; and when he was obliged, by sickness, to relinquish his practice, he had, in his desk, for he never kept a banker, nor invested any money in the funds, about £350. This, with his books, his little plate and furniture, and a gold Rumford medal, made up the sum of his worldly fortune.

In 1800, he was seized with a slight fit of apoplexy, from the effects of which he never fully recovered.—About the year 1812, he began to suffer with symptoms of hydrothorax; and these continued, with some fluctuations in their degree of severity, but with gradually increasing intensity until the 18th of September, 1817, when he expired.

Such is a rapid enumeration of the leading events in the external life of Dr. Wells. There is very little about

them either brilliant or imposing, and in order to understand at all the importance and the value of his life, we must turn to the study of his works.

In 1799, Dr. Wells addressed a letter to Lord Kenyon, in relation to certain alleged abuses existing in the official conduct of the Fellows of the Royal College of Physicians in London; and in the organization and by-laws of the college. This letter occupies nearly one hundred and forty pages of the edition of Dr. Wells's works, from which most of the materials for this sketch are derived; it is written with very great ability, and it exhibits in a clear and strong light, some of the most prominent elements in the character of Dr. Wells. For these reasons I intend to notice it, and some of the circumstances which called it forth somewhat fully. Apart from the connexion of these with this letter, and with the history of Dr. Wells, they can hardly fail, I think, to be of some interest to the American reader.

The Royal College of Physicians in London is of great antiquity, and it may certainly be regarded as one of the most distinguished associations of medical men that has ever existed. It was incorporated in 1518, during the reign of Henry viii, through the influence of the learned Linacre with Cardinal Wolsey. The Fellows of the College, beside being endowed with the usual privileges of close corporations, were empowered either by the terms of the original charter, or by successive additions to it, to examine into the qualifications of all physicians throughout England, except the graduates of Oxford and Cambridge; to search apothecaries' wares; to license lunatic houses; and in the exercise of their powers to commit offenders to any prison in London except the tower. No persons were allowed to practice medicine unless they were "*profound, sad, discreet, groundedly learned, and deeply studied in physic.*" The object of the founders of the college, and of the British legislature,

in its incorporation, was to elevate and improve the character of the medical profession, and to protect the public, as far as possible, against the practices of ignorant and incompetent physicians. It is very evident, however, that even during the early periods of its existence, either through the selfishness of its Fellows, or from that easy sophistry, which so often convinces men in power, that their own elevation and supremacy are necessary to the interests and the welfare of those who are subject to them, the college overstepped the principal objects of its institution, and converted the powers, which had been bestowed upon it solely for the public good, into means and instruments for advancing the private and selfish ends of its Fellows. One of its earliest acts, tending directly towards the accomplishing of these ends, was that of limiting the number of its Fellows; thus excluding the great body, even of its own licentiates, from the honors and emoluments, directly or indirectly growing out of the Fellowship of the college. An arbitrary and invidious distinction, unauthorized by either the objects or the terms of the charter, was thus established between the Fellows and the licentiates of the college. Amongst other assumptions of authority, the college arrogated to itself the power of establishing conditions of admission, amongst both its Fellows and its licentiates, of the most unjustifiable and arbitrary nature. One of these was, that no person should be admitted either as a Fellow or a licentiate, who had ever been an apothecary, or sold drugs, or who had ever practiced midwifery as a part of his profession. These usurpations gave rise, as might have been expected, to complaints and resistance, on the part of those who felt themselves aggrieved by these outrages upon their feelings and their rights; and we accordingly find, that almost the entire period of the existence of the college has been marked by heart-burnings, jealousies, quarrels, and law suits, between the different classes of its mem-

bers. Its Fellows were generally men of high professional rank, and extensive influence; some of them were almost always connected with the court; principles of justice, generosity, and right operated feebly upon the minds of men excited and influenced by strong and immediate personal interests; and it is not difficult to understand, why, in these contests, the college should have been the successful party. It appears, however, that notwithstanding these circumstances, the college did not always escape censure, even from the high courts, to which it appealed for the maintenance and protection of its assumed powers. In the year 1638, it was admonished by Chancellor Jeffries, on account of subverting the original intent of its charter.* The college was again censured in 1700, by Chancellor Somers; and in 1768, Lord Mansfield cautioned against narrowing its grounds of admission, as it seemed to have done, so that a Bœrhaave, if a resident in London, would have been excluded from its Fellowship.†

Amongst the distinguished persons who had quarrels and contests with the college, were Dr. Fothergill and Dr. William Hunter.

Although John Mason Good was a graduate of an English University, and aided Sir Henry Halford in the composition of his celebrated oration, he was refused admission to the full honors of the college, and placed among its *permissi*, because at one period of his life, he had been a general practitioner.

Catholics and dissenters were excluded from its Fellowship, the terms of admission requiring an assent to the church articles.

Sir Gilbert Blane constantly refused the proffered honor of a Fellowship.

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*London Lancet, vol. xii, p. 108. †Ibid.

Without going any farther into the history of the college, I will now return to the letter of Dr. Wells, and to the circumstances which led him to write it. In the year 1797, he mentioned to two of his friends, both of them Fellows of the society—Dr. David Pitcairn, and Dr. Matthew Baillie—his intention of applying to the college for an examination of his fitness to become a Fellow. On the 29th of September, a motion was accordingly made by Dr. Pitcairn, and seconded by Dr. Baillie, that Dr. Wells should be admitted to this examination. The motion was resisted, and finally defeated—there being only ten votes out of twenty-three in its favor. In the following year, Dr. Wells, with the assistanee of his two friends, made another effort to obtain an examination, and was again defeated. This harsh treatment on the part of the college seems to have been the immediate occasion of Dr. Wells's letter. After entering somewhat fully into the history and merits of the case of Dr. Stanger, who had then recently been unsuccessful in an application for a like examination, Dr. Wells takes up the subject of his own grievances. As to his qualifications for a Fellowship, so far as knowledge was concerned, he says:—"Nine years previously to my being proposed by Dr. Pitcairn, I had undergone the trials of fitness, to which licentiates are subjected before admission to practice, and if I may venture to credit what was said by Sir George Baker, and the censors who examined me, I had passed through those trials with more than ordinary ease. In the interval, I had become a member of the Royal Society, the certificate of my fitness for which was signed by the late and present residents of the college, Sir George Baker, and Dr. Gisborne, and by four others of the present Fellows of that body. During the same interval I had endeavored to extend the boundaries of our knowledge in various parts of natural philosophy; and two of my attempts of this kind, certainly not the most considerable, had been

recorded in the printed transactions of the Royal Society. As I had thus demonstrated industry at least, in the cultivation of sciences collateral to medicine, it is not probable that I had been inattentive to the study of my own profession, since my peace of mind necessarily depended upon my understanding it. Nor had my opportunities of gaining experience in it been very small; for I had been eight years a physician to an extensive establishment for the relief of the sick poor, and I had also been physician, for some time, to another institution of the same kind, but still more considerable. From all these circumstances, I think it will readily be allowed by your Lordship, that it was not likely I had become less learned since passing the trials of a licentiate."*

In connexion with his moral fitness for the place which he desired, he thus speaks of the persons who made and seconded the proposal for his examination:—"One of these gentlemen must already be well known to your Lordship. I cannot, however, refrain from saying respecting him, that the son of the gallant Major John Pitcairn, who died the glorious and enviable death of a soldier fighting for his country, and the adopted son of the high-minded, upright, and generous Dr. William Pitcairn, must have every title to the strictest honor, which inheritance, education, and domestic example can bestow. But why do I speak of titles, after his countrymen had acknowledged his complete possession of that most invaluable property, and had in consequence, as well as from their high opinion of his learning and skill, placed him at the head of the profession of medicine, in the metropolis of Great Britain." Dr. Wells adds, in a note, this commentary:—"Two circumstances must concur to place a Physician at the head of his profession in London:—1.

*Works of Dr. Wells, p. 330.

Great employment, which alone is certainly not sufficient for that purpose, as it is often possessed by persons of no considerable ability. 2. Respect from other Physicians, indicated by their frequently requesting his aid in their practice. This can arise only from a high opinion of his honor and skill, of which qualities in a Physician, scarcely any but those of his own profession have either opportunities or capacity to judge rightly. Dr. Pitcairn, from the death of Dr. Warren to his own unfortunate illness, was indisputably the Physician in London, in whom these circumstances existed together in the greatest degree." "He who seconded the proposal," says Dr. Wells, "Dr. Matthew Baillie is more upon a level with myself, in regard both to age and length of residence in London. Somewhat therefore of the obscurity which involves almost every young Physician may have hitherto concealed him from your Lordship's notice. But that obscurity is fast dissipating, and he must soon, my Lord, very soon, appear to your view, with all the just proportions and accurate lineaments of a man of integrity, learning, and great professional skill."* This judgment was pronounced just at the period when the sun of Dr. Baillie's reputation was rising to its zenith; and one can hardly fail of being struck with the broad and touching contrast presented in the lives—from this time onwards—of these two men. Dr. Baillie may fairly enough be taken as the fittest type and representative of one of the noblest classes of men, that have ever blest and adorned humanity—the leading practitioners of medicine in Great Britain, during the last century. Skilled alike in ancient and in modern lore—grave and polished in their manners—courteous in their intercourse with all classes, but loyal to the stern and tyrannous social aristocracy of their land—upright,

*Works of Dr. Wells, p. 324.

benevolent, generous, industrious, skillful, and humane—worshippers of God, and lovers of men—they filled up faithfully the measure of their laborious and beneficent lives, and left to their survivors memories embalmed in the fragrant amber of gratitude and love. Dr. Baillie's father was a professor in the University of Glasgow—and his mother was a sister of the Hunters; Miss Joanna Baillie was his sister, and he married the daughter of the celebrated Dr. Denman. He studied his profession under the immediate personal direction of his uncle, William Hunter, and at the early age of twenty-two years, in connexion with Mr. Cruikshank, he continued the anatomical lectures at Mr. Hunter's school in Windmill street. Dr. Pitcairn, then at the head of the profession in London, made his friend, Dr. Baillie, the heir of his immense and lucrative practice; and under such auspices, and with his high qualifications, and his many excellent qualities of head and of heart—his thorough knowledge of his profession—his untiring industry—his exclusive devotion to his business—his clear, strong sense—his sound judgment—his simple, unostentatious, and dignified manners—his truthfulness—his generosity—his kindness to those less favored by fortune than himself—it is not strange that he rose so rapidly to opulence and fame. He died in 1823, having lived for twenty years in the full blaze of professional popularity; long a favorite attendant in the household of his sovereign, and his services in constant requisition by the noble, the fashionable, and the great. During a considerable portion of these same years of prosperity and success, Dr. Wells was also a London practitioner;—with high qualifications—a favorite friend both of Baillie and Pitcairn—but how widely different were the circumstances which attended his career, and the fortune which awaited him! *with five friends*, as he so sadly and touchingly says, *in the world;* abstemious in his habits, and almost sordid, to use his own words, in his manner of

living—struggling on from dismal year to year, in this boiling and turbid ocean of London life, with shattered and failing health, and scanty resources, but still paying scrupulously his income and property tax, and allowing for a good many years an annuity of £20 to a female relation; after a night passed in the open air of his garden at Surrey, plodding his way on foot to the houses of his few patients, or to the hospital and dispensary—a solitary wanderer through the crowded thoroughfares of the metropolis; receiving, at least in one conspicuous instance, and in a matter closely connected with his highest aspirations, and near to his heart, only harshness, contumely, and neglect, where he deserved and should have found only kindness, respect, and honor; and all this dull and hard environment of his life uncheered and unilluminated by the light and the warmth of the domestic affections, and of home!

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in the estimation of mankind. A contemplation of his excellencies therefore can afford little help towards obtaining a just notion of the general worth of physicians. In speaking of a molehill, we would not employ terms that had relation to the immensity of a mountain.

"Were I, my Lord, possessed of talents adequate to the undertaking, I should here endeavor to describe at full length the character of that illustrious man. In this attempt, I should first mark his various and extensive learning, his modesty in the use of it, and his philosophical distrust of human opinions in science, however sanctioned by time, or the authority of great names. I should then exhibit him in the exercise of his profession, without envy or jealousy; too proud to court employment, yet undervaluing his services after they were performed; unwearied, even when a veteran in his art, in ascertaining the minutest circumstances of the sick, who placed themselves under his care, taking nothing in their situation for granted, that might be learned by inquiry, and trusting nothing of importance that concerned them to his memory. To demonstrate his greatness of mind, I should next mention his repeatedly declining to accept those offices of honor and profit at the British court, which are regarded by other physicians as objects of their highest ambition, and are therefore sought by them with the utmost assiduity. I should afterwards take notice of his simple yet dignified manners, his piety to God, his love for his country, and his exemplary discharge of the duties of all the private relations in which he stood to society; and I should conclude by observing that his whole life had been regulated by the most exquisite prudence, by means of which his other virtues were rendered more conspicuous and useful, and whatever failings he might as a human being possess, were either shaded or altogether concealed. After my description was finished, I should think it proper to say, that I had never been acquainted with Dr.

Heberden, and consequently could neither be dazzled by the splendor of his virtues, from approaching them too nearly, nor influenced in my opinion concerning them, by benefits he had already conferred upon me; and that standing, as he does, upon the verge of this state of existence, ready to wing his flight to another of glory, his ear must now be closed to the voice of flattery, had he ever listened to that siren, or were I base enough to solicit her aid, in the foolish expectation of receiving from him some future reward."*

In the memoir of his life, Dr. Wells says: "About four years ago Dr. Baillie asked me, in the name of the President of the Royal College of Physicians of London, if I had any desire to become a Fellow of it; to which I answered that I had none."†

Dr. Wells published an essay upon single vision with two eyes, and observations on several subjects in optics—rather speculative than experimental in their character, and leading to no very important or positive results. He furnished several short biographical sketches for the Gentleman's Magazine; several of his papers were published in the Philosophical Transactions, and in Thomson's Annals; and there are twelve papers on medical subjects, furnished by him, in the second and third volumes of the Transactions of a Society for the Promotion of Medical and Chirurgical Knowledge. The first paper, he says, which he ever wrote for the public, was an account of Mr. Henry Laurens, some time president of the American Congress, and which was published in a newspaper in 1780. He also furnished for the journals many political articles during the years 1780 and 1781; the most important of which was a paper upon the subject of military punishments—a paper which, he intimates, may have

*Works of Dr. Wells, p. 375. †Works of Dr. Wells, p. 40.

influenced General Balfour and Lord Moria in putting to death a Colonel Haynes, the propriety of whose fate was afterwards a subject of debate in the British House of Commons.* The memoir of his own life was dictated to his friend Mr. Patrick at intervals during his illness, after he had lost all hope of recovery, and while he was uncertain whether he should live to finish it, and when he was too feeble to speak long, or to write much.† He contemplated the publication of a metaphysical treatise; and he intended to have presented to the Royal Society several papers on Vision.

The work of Dr. Wells which has given him his chief scientific celebrity—which has written his name in the fair annals of science, beyond the reach of accident or time—is his *Essay on Dew.* A late brilliant writer quotes the concluding lines of Walter Savage Landor:

> "Pleased it remembers its august abodes,
> And murmurs as the ocean murmurs there,"

and then makes the following remarks:—"These are the far famed lines on a shell, which Wordsworth has imitated, and every body praised, and which, if they will not immortalize the name of Landor, nor embalm the poem of Gebir in which they occur, have assuredly immortalized and embalmed themselves. And never in remotest time, shall any one who has once heard or read them, gaze into the white depths of the child of ocean, or apply to his ear its polished coolness, and hear or seem to hear the faint and far-off murmur of the main, without imagining that these are the words which the gentle oracle is uttering, and this the meaning of the spiritual and mysterious music. They are among those rare lines which, giving to a common thought or belief an expression poetic and ideally perfect, stamp themselves at once

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*Works of Dr. Wells, p. 43. †Works of Dr. Wells, p. 42.

on the heart and memory of the world. *Enviable the powers which by one true and strong line render oblivion impossible.* Who does not bless the nameless warrior who has left the noble epitaph: *Siste viator, heroem calcas*, as his sole memorial? So cheaply, sometimes, does genius purchase immortal fame!" What huge cart-loads of poetry—so called—we may continue in a similar strain, are yearly trundled into market; what countless acres of the same article—all the lines regularly marshalled—armed and equipped according to the laws of Parnassus—trotting off on their due number of feet—their heads bristling with capitals, and their tails jingling with rhyme—are every month spread out before us on the innocent pages of newspapers and reviews—to be read before breakfast, and forgotten before dinner; while one brief hour of happy inspiration has given to the short and simple lines on the burial of Sir John Moore an immortality as assured and irrevocable as that which awaits on the Paradise Lost and Macbeth. And analogous, at least, to these instances, is the character, and the history of the *Essay on Dew.* Certainly, it would be extravagant to place the Essay of Dr. Wells in the same rank and scale with the *Novum Organum* and the *Principia*, or to compare his discoveries with those of Galileo, and Harvey, and Jenner—but amongst the works which come next to these transcendant achievements of the human intellect, there is no one which has attained, as there is no one which deserves a more eminent position.

What a beautiful phenomenon is that of Dew! As soon as the diminishing rays of the declining sun allow the surface of the earth to lose something of its noon-tide heat, this silent distillation from the great alembic of the atmosphere begins; and through the evening and the morning twilight, and the serene watches of the night, every leaf of the forest, every blade of grass, and every

flower of the field, gathers its beaded and transparent gems, to glitter like flashing diamonds, and to be exhaled like auroral incense in the rays of the early sun. And as if to give to this phenomenon an especial and particular beauty, it is witnessed only under cloudless heavens and in still nights; when the winds are hushed, and the stars are shining in the sky. What a delicious element would be lost from the manifold charm and glory of a summer dawn, if there was no dew on the grass and the flowers! And how would the breath of Aurora be robbed of its fragrance, and her roses of their freshness and their bloom!

Up to the time of Dr. Wells's researches, the true character of this process, the real causes of this phenomenon were entirely unknown. From the age of Aristotle, it had been a common observation, that dew appears in considerable quantities only on still and clear nights; and in the latter part of the last century, it was noticed by Dr. Wells, by Mr. Patrick Wilson, of Glasgow, and by Mr. Six, of Canterbury, that the formation of dew and of hoar frost is attended by the production of cold. Mr. Wilson and Dr. Wells, at this time, supposed that the cold was occasioned by the formation of the dew—that the latter was in some way the cause of the former. Musschenbrock and Dufay had studied the subject of dew, but had failed altogether to discover its true philosophy. Dufay and some others believed the deposition of dew to be an electrical phenomenon. Aristotle, Professor Leslie, of Edinburgh, and others, believed dew to be a species of rain, "formed in the lower atmosphere, in consequence of its moisture being condensed by the cold of the night into minute drops."* Gersten, who published an Essay on Dew in 1733, Noah Webster, of Connec-

*Works of Dr. Wells, p. 177.

ticut, and some others, adopted the opinion that dew consists in vapor emitted by the earth at night, and condensed by the cold.* Such were the prevailing doctrines upon this subject, when Dr. Wells commenced his investigations, under circumstances and conditions, that give a touching and melancholy interest to the scene. This was in the autumn of 1812. Dr. Wells was then fifty-five years old—a lonely, austere, and abstemious man—the distressing disease which in a few years terminated his hard and chequered career, already far advanced; his ankles swollen at the close of the day—on the slightest exertion panting with breathlessness and palpitation, and

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*"As dew appears to collect only during fine clear nights, when the heavens glow with sparkling constellations, the ancients, in the infancy of science, imagined it to be actually shed from the stars, and therefore to partake of a pure and celestial essence. Hence the vulgar notion that *dew falls*, which has prevailed through all ages, and continues to tincture every language. * * The dew of heaven has always been regarded as a fluid of the purest and most translucid nature. Hence it was celebrated for that abstergent property which, according to the vulgar persuasion, enables it to remove all spots and stains, and to impart to the skin the bloom and freshness of virgin beauty. Like the elixir of later times, it was conceived to possess the power of extending the duration of human life; and Ammianus Marcellinus ascribes the longevity and robust health of mountaineers, in comparison with the inhabitants of the plains, chiefly to the frequent aspersion of dew on their gelid bodies. Dew was also employed as a most powerful agent, in all their operations, by the alchemists, some of whom pretended that it possessed such a subtile and penetrating efficacy as to be capable of dissolving gold itself. Following out the same idea, the people of remote antiquity fancied that the external application of dew had some virtue in correcting any disposition to corpulence. The ladies of those days, anxious to preserve their fine forms, procured this celestial wash, by exposing clothes or fleeces of wool to the humefaction of the night."

"The opinion that dew falls from the sky maintained its credit during the course of the middle ages. The alchemists even carried this idea so far as to fancy that, since the dew gradually vanishes in the progress of the day under the action of the solar rays, it then merely seeks by sympathy to regain its native seat in the highest heavens. Nay, some of those ingenious enthusiasts have not scrupled, in confirmation of their wild hypothesis, broadly to assert that a few drops of morning dew, being enclosed in an empty egg-shell, which is placed at the foot of a ladder resting against the roof of a house, the shell will become buoyant while the sun shines, and will mount along the ladder till it reaches the very top.

Encyclopædia Brittanica. Article, Dew.

his nights disturbed with restlessness and pain. Provided, as the principal parts of his apparatus, with some small thermometers, some plates of different kinds of metal, a few watch-glasses, and small pledgets of swan's down and wool, he repaired to the theater of his labors, which he describes in the following words. "Previously to mentioning the results of any of my experiments with these parcels of wool, I think it right to describe the place, where by far the greater part of my observations on dew were made. This was a garden in Surrey, distant, by the public road, about three miles from the bridge over the Thames at Blackfriars, but not more than a mile and a quarter from a densely built part of the suburbs on the south side of that river. The form of the garden was oblong, its extent nearly half an acre, and its surface level. At one end was a dwelling house of moderate size, at the other a range of low buildings; on one side a row of high trees, on the other a low fence, dividing it from another garden. * * Within it were some fruit trees, but, as it had not been long made, their size was small. Towards one end there was a grass-plat, in length sixty-two feet, and nearly sixteen broad, the herbage of which was kept short by frequent mowing. The rest of the garden was employed for the production of culinary vegetables."*

With the simple apparatus to which I have alluded, on the green sward of this little garden in Surrey, with only the silent stars and the blue sky above him, did the philosopher meekly and reverently enter the great temple of Nature—an earnest seeker of her secrets—an humble worshipper at her shrine. And the true offering which he laid upon her altar was blessed and accepted; the veil which had hidden one of her most beautiful mysteries

*Works of Dr. Wells, p. 137.

was withdrawn; a new and one of the fairest pages in her great volume was opened at his invocation to the wonder and admiration of the world. Few and simple as were the means with which Dr. Wells conducted his researches, his experiments were so various, so direct, and so conclusive—so sagaciously devised and so admirably executed—that the whole philosophy and economy of the subject, which he studied, were completely and definitively settled. It would be difficult, I think, to find any other instance in the history of physical science, where a subject, hitherto so little understood, was so thoroughly and so satisfactorily investigated, by a single, unaided inquirer; and where so little was left, either for amendment or addition by subsequent observers. From the commencement of Dr. Wells's researches, in the fall of 1812, he continued his experiments, often through the whole night, returning to his professional labors in London during the day, frequently interrupted by his increasing ill-health, till near the close of the following year, when he became so infirm and feeble as to be obliged to discontinue altogether his visits to his garden.

"In the beginning of 1814, a considerable snow having fallen, I could not resist," he says, "the temptation of going for several evenings to Lincoln's-Inn-Fields, during a very severe frost, in order to repeat and extend some of Mr. Wilson's experiments upon snow." But he was soon obliged to desist, and his symptoms became so alarming, that his friend, Dr. Lister, earnestly urged him to remain quiet, and announced to him that, in all probability, a few months would terminate his earthly career.

"Upon receiving this opinion," he says, "I set about immediately composing my Essay on Dew, as my papers containing the facts on which my theory was founded, would, after my death, be altogether unintelligible to any person who should look into them. I labored, in consequence, for several months with the greatest eagerness

and assiduity, fancying that every page I wrote was something gained from oblivion." And something it certainly was, gained from oblivion, and worth gaining from oblivion. This was his labor of love, and worthily did he accomplish it. He lived not only to complete his essay, but to publish a second edition. A generation has since passed away;—Science, with her manifold faculties —restless, unappeasable, longing for absolute and boundless dominion,—her forehead flushed with daily triumphs, and radiant with undying youth,—has extended in every direction the area of her empire, crowding and adorning it with her trophies;—art and industry have changed not only the whole face of nature, but the most intimate and vital relations of life and society, the intercourse of man with man, and the interchange and transmission of thought; but this handiwork of Dr. Wells still stands as he left it—not like the colossal calculus of Newton, holding in its stupendous embrace, alike the light dust on the balance, and the infinite universe of worlds; but, nevertheless, finished, faultless, and entire,—compact and perfect in itself,—graceful and imperishable as one of the granite obelisks of the Nile, resting its basis on the solid earth, and lifting its apex high towards the heavens. Such is the clear and concurrent verdict of scientific men; and as long as the earth in her annual circuit round the sun, proclaims, in the music of the spheres, the name of Galileo;—as long as the glory of Newton is set with the rainbow in the firmament;—as long as the fame of Harvey is spoken by every throb of the beating heart; as long as the lightning flashes forth from horizon to horizon the great discovery of Franklin; so long shall the hoarfrost and the dew, as through winter and summer, in each still and starry night, they gather and sparkle, over all the broad surface of the earth, upon hedgerows and fences, upon mountain and valley, upon field and forest and meadow, upon cottage-roof and temple-dome, keep green

and unfading the name and the memory of William Charles Wells.*

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* A critique on the essay appeared in the Quarterly Review for October, 1814, written, as it appears from a reply of Dr. Wells, by the learned and philosophical Dr. Thomas Young. The notice is, on the whole, commendatory; but it almost damns with its faint and reluctant praise. Dr. Young says that the theory advanced by Dr. Wells is a consequence so simple and obvious of the principles deduced from the discoveries of Mr. Leslie and other observers, and then generally admitted, that it only required to be distinctly stated and clearly understood, in order to be considered satisfactory. The notice is concluded in the following manner, the allusion in the last sentence being intended for the writer [Dr. Young] himself:—"Had Dr. Wells been as solicitous to attend to the labors of his cotemporaries as he has been very laudably anxious to recur to those of his predecessors, he might have said, not that the experiments of Mr. Prevost *might* be easily accounted for, from the properties he mentions, but that they actually *had* been explained in a similar manner by one of his own countrymen. There are, however, some modern philosophers, who, whether from their own fault, or from that of their hearers and readers, or from both, appear to be perpetually in the predicament of the celebrated prophetess of antiquity, who always told truth, but was seldom understood, and never believed; and the author of the lectures in question has not unfrequently reminded us of the fruitless vaticinations of the ill-fated Cassandra."

Dr. Wells replied to Dr. Young, at considerable length, in Thomson's Annals for April, 1815. To the remark of the learned writer, that the theory of Dr. Wells is a simple and *obvious* consequence of principles deduced from the discoveries concerning heat, by Mr. Leslie and other observers, he replies by saying:—"The inquiry of Count Rumford, and the essay of Mr. Leslie, were both published in 1804; and in these works are to be found all the new facts relating to heat, which I have taken from others in forming my theory of dew. Whether Count Rumford ever afterwards treated of atmospherical appearances is unknown to me; but Mr. Leslie published, nine years after his essay, a work on heat and moisture, in which, agreeably to the opinion of Aristotle, the production of dew is attributed to the condensation, by the cold of the night, of watery vapor diffused through a considerable portion of the atmosphere. Now, when the great ingenuity of Mr. Leslie is considered, if the theory of dew, which I have proposed, be an *obvious* consequence of his own discoveries, it would assuredly have occurred to him, in that long space of time, since he has shown that the subject of dew had in the meanwhile occupied his attention."†

Dr. Wells's answers to other portions of the criticism seem to me to be equally fair, manly, and satisfactory. He concludes in the following terms:—"But, I must, on the other hand, be permitted to say that if Dr. Young, forgetting that Newton became a glass-grinder in the service of science, will neglect to employ, for the increase of natural knowledge, the

* Quarterly Review, February, 1814.
† Thomson's Annals, April, 1815.

A few traits of character, picked up from the memoir of his life, will serve in some degree to complete the portrait of Dr. Wells, which I have been endeavoring to sketch. One can hardly help being struck, amongst other things with the *variety* of his occupations, and the *versatility* of his powers. After having crossed the Atlantic to pursue his early studies in Scotland, we find him again in America, a medical student; in a few years, driven by the storm of the revolution, back to Great Britain, and pursuing his medical studies in Edinburgh; doing duty as a surgeon to a Scotch regiment in Holland; imprisoned and finally dismissed the service, for insubordination and rudeness toward his superior officers; preparing his Latin thesis at Leyden; returning from the continent to Scotland and thence to Carolina; looking after the affairs of his family there, and endeavoring to effect a reconciliation between his father and brother; acting at the same time as an officer of volunteers, and a judge advocate in a general court martial of militia officers; engaged as a printer, bookseller and mercantile agent; publishing and conducting a political newspaper in Florida; again captain of a company of volunteers; theatrical manager of a company of young officers, who performed plays for the benefit of the indigent loyal refugees from Carolina and Georgia, achieving great success, he says, in the characters of Lusignan in Zara, and Old Norval in Douglas, but failing in the part of Castalio in the Orphan, and doing still worse in his attempts in comedy; returning from

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slow and laborious method of observation and experiment, and will frequently exhibit his speculations in a manner, unsuited to the capacities of ordinary men, he ought not to think it strange, that opinions advanced by him on difficult points of philosophy, are not, agreeably to his own remark at the end of the criticism, received as truths beyond doubt, and are often not understood."*

* Thomson's Annals, April, 1815.

Florida to Charleston, to be assailed by mobs, and imprisoned for debt; going back finally to England; engaging in London in public and private practice; enriching the literature of his country with *medical*, *philosophical*, *metaphysical* and *polemical* essays of great ingenuity and remarkable ability; and at last crowning his life and labors with one of the finest achievements of inductive philosophy that the world has ever seen.

It would have been strange and unnatural, if the rough and harsh discipline of his life had failed to leave some of its traces on the habits and temper of his mind—wayward, irritable and impulsive as this naturally was. Dr Garden once attempted to strike him; he eluded the blow, and for three years afterwards, reserved and distant in his manners, he held himself aloof from the society of his teacher and of the young men of the town, and devoted himself seriously and exclusively to his studies.—When acting as surgeon of a regiment in Holland, having received some injury from the colonel of his regiment, he attacked him openly in the street, and challenged him to fight. "I lived," he says, "till I was near eleven years old, close upon the harbor of a large sea-port in America, and by this means associated much with blackguard sailor boys. To this I attribute a practice of swearing, of which I have from the time of being a child, been frequently guilty, when my feelings have been agitated, and even sometimes when no excuse of this kind has existed."* "My temper," he adds in another place, "was naturally irritable, and in small differences which have occurred in society, particularly in my youth, passionate and violent. But, I must, in justice to myself, say, in the first place, I have not shown any considerable instance of this kind,

*Works of Dr. Wells, p. 48.

for nearly twenty years; and in the second, that I did never show one, even before that time, in any matter of consequence, or when I had any respect for the person with whom I differed. In confirmation of both these remarks, I shall mention, first, that I have never had the smallest difference with any one of my five most intimate friends; and secondly, that I have borne the grossest insult, when it was unmanly to take immedite notice of it."*

I have already spoken of the conservative character of his political principles. In the course of his memoir, he says, "From the time of the murder of the Princess Lamballe, I foresaw the ruin of all civilized society in France, and dreaded a similar ruin of all civilized society in Europe; I have never, therefore, been able to hear, with the least patience, any serious defence of the conduct of the French; and have always attributed such a defence to incurable folly, self interest, or madness. In all points of domestic politics, I have kept myself free from personal influence, by never seeking the acquaintance of any person of the least influence in the country. By principle I am a constitutional Tory; but my manners, I should think, would lead most persons to regard me a republican."†

Finally, and as we drop the curtain upon this chequered landscape of human life, which for the passing hour we have been contemplating, let us turn our last lingering gaze upon the clouds which envelope it, lighted up with the serene radiance of generous friendship and manly love. With what simple, and beautiful, and touching sincerity does he speak of his friends. "My last declaration," he says, "will relate to the obligations under

*Works of Dr. Wells, p. 58.
†Works of Dr. Wells, p. 60.

which I lie to my friends. I have already spoken of my rare good fortune, in having acquired, in the course of my life, five most intimate friends." These friends were David Hume, Mr. William Miller, afterwards Lord Glenlee, Dr. Robertson Barclay, Dr. Matthew Baillie, and Dr. Lister. "All of these," he continues, "are still in being, and from all of them I have received, throughout my illness, the warmest proofs of attachment. Two of them, however, have most especially afforded such proofs, Dr. Lister, and Dr. Baillie, partly from their residing in London, and partly from the nature of their profession. My obligations to Dr. Lister are extreme. During the whole of my disease, he has visited me constantly twice, and sometimes thrice a day; and during each of these visits, he has conducted himself towards me, with fully as much kindness, as if I had been his brother."*

ART. IV.—*Notes on a Case of Fatal Poisoning by Metallic Arsenic*

By B. SILLIMAN, JR., M. D., Professor of Chemistry and Toxicology in the University of Louisville, and of Chemistry applied to the Arts, in Yale College.

The case here related is of interest chiefly because of the comparative rarity of this mode of arsenical poisoning. The facts of the case and the steps of my examintion are given very nearly in the words of the deposition —this may account for the want of condensation in this communication, which might otherwise be presented in much fewer words. It may not, however, be without interest to the general reader, as showing, to some degree, the manner in which the toxicologist proceeds in such cases.

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*Works of Dr. Wells, p. 49.

On the fourth day of September, 1849, Dr. J. W. C., of Bristol, Connecticut, brought to my laboratory the stomach of a man, who, as he stated, died in the town of Bristol, under suspicious circumstances, leading to the supposition that he had been poisoned. I consented to make a toxicological examination of the stomach, at his request. This I commenced in his presence immediately after the presentation. The stomach was presented to me in a vessel of alcohol; both the orifices of the organ were tied with ligatures, which, as I was informed, were put on before its removal from the body. The stomach had not been opened; it was to appearance fresh, no change nor decomposition having taken place; nevertheless it appeared of a livid and unnatural color. A strong, horizontal line divided it into two equal portions, the lower portion being dark, the upper opaque and not unnatural in its appearance. With Dr. C.'s assistance I opened the stomach by a long incision, exposing its interior. Its internal appearance was strikingly unhealthy, livid and inflamed, resembling the effects of acute gastritis. Its contents appeared singularly unnatural, being not less in quantity than one pint of dark colored, brownish fluid, thick, and resembling in color and appearance rich chocolate. The line of division spoken of before, was not so apparent on the interior as on the exterior. The whole interior surface presented strong evidence of inflammation; the color was livid, with lines of extravasated blood. The mucous coat was lined with the chocolate colored matter before mentioned. I detected no trace of food in the stomach, save a few filaments of reddish matter resembling the skins of tomatoes.

My first chemical examination was made upon the contents of the stomach. I proceeded to analyze the chocolate colored matter. After reducing it to a transparent solution by means of agents of known purity, I submitted it to the action of a current of sulphuretted hydrogen. I was soon satisfied, from the orange colored precipitate

that was produced, that there was some metallic substance present in the stomach. This precipitate was not very abundant, nor of so deep an orange color as to be of the most decided character. It was, however, completely soluble in caustic ammonia—a character which belongs to the sulphuret of arsenic. The evidence obtained by this preliminary trial was such as to induce farther and more critical examination as to whether the suspected substance was arsenic, antimony, cadmium, or tin—the only metals capable of producing a yellow compound with sulphur under the circumstances above described. I searched, at first, in vain upon the coats of the stomach for anything resembling a white powder.

My next step was to take a portion of the substance of the stomach itself, as well as of its contents. This I proceeded to reduce, by means of the process of Fresenius and Von Babo, to the state of a perfect and colorless solution. This process, occupying several consecutive hours, was conducted with care, to avoid contamination from every source—meanwhile, with the advantage of a stronger light, I employed myself with a more critical optical examination of the surface of the coats of the stomach, hoping to detect thereby something which should indicate the probable cause of the appearance before described. On scraping the dark brownish matter from off the coats of the stomach, I observed in several places, adhering firmly to the mucous coat of the organ, dark colored grains, resembling at first sight grains of black pepper; some of them, however, had a metallic lustre and resembled tinfoil. On inspecting these metallic grains, it at once occurred to me that they might be metallic arsenic, or "cobalt," as this substance is absurdly called, in the shops of the apothecary and in commerce. I accordingly proceeded to determine by experiment the true nature of these grains. On heating some of them in a closed tube of glass they were entirely volatilized, or sublimed, lining the interior of the tube with a brilliant

metallic coat, whose surface reflected like a mirror. The extreme borders of this metallic ring were fringed with a white crystaline powder. Another portion of these grains was in like manner volatilized, but with the access of air. In this case the dark metallic coat at first formed was rapidly changed to a white crystaline coating, which on examination with a magnifying glass was seen to consist of a great number of minute but very brilliant eight-sided figures. Another tube, in which a portion of these metallic grains from the stomach had been sublimed and converted by the aid of heat and air, into the white crystalline lining last described, was next treated by a current of sulphuretted hydrogen gas, by which means, with the aid of heat, the white coating was completely converted into a brilliant yellow substance, entirely resembling the yellow sesqui-sulphuret of arsenic, or orpiment. That no doubt might remain as to the real nature of this substance, I proceeded next to pass through the same tube a current of strong ammoniacal gas. The yellow coating was thereby immediately dissolved into a clear transparent yellow fluid. By the aid of a gentle heat the ammonia was expelled from this fluid, and the original yellow coating reappeared as before. The series of properties here described is found in no other substance than arsenic.

The evidence above detailed is such as produced the strongest conviction that the substance under examination was metallic arsenic, and that it could be nothing else.

The above experiments were conducted mainly during the interval of two days, in which the portion of the stomach already alluded to and its contents were in process of transformation from the solid condition to that of fluidity. My next trials were made on the solution thus produced, with a view to the detection of similar evidence in it. The result, however, already obtained, led me to expect, that the evidence to be derived from the muscular tissues of the stomach, would be much less remarkable than that

obtained on the solid contents, to wit: the metallic grains before spoken of. The solution was treated with a current of sulphuretted hydrogen gas. In a short time a very decided precipitate, of an orange yellow color, appeared in the solution, after standing for some hours in a warm place. This was collected upon a filter, separated from the solution, and carefully dried at a regulated temperature. A portion of this yellow precipitate was mixed with appropriate reducing agents, in a tube of hard glass, and exposed for a short time to a red heat; the neck of the vessel during this process of heating, became lined with a dark metallic-looking coating, resembling in all respects the similar rings produced by arsenic.

Another portion of this yellow precipitate produced from the solution of the stomach, was treated with caustic ammonia—complete solution ensued. This is a characteristic property of the yellow sulphuret of arsenic.

I next proceeded to try a test which is regarded by most chemists as one of peculiar certainty. This test is known as Reinseh's test; from the name of the discoverer. I regard it as of any single tests the most satisfactory, as well from the unequivocal evidence which it yields as from the facility of its application in cases where other tests may give equivocal evidence. A portion of the suspected substance made slightly acid by hydrochloric acid, and freed from turbidness by filtration, is boiled for a few moments in contact with a slip of bright metallic copper. If arsenic is present in the most minute quantity, the surface of the copper becomes immediately tarnished, and assumes the color of steel more or less completely in proportion as the quantity of arsenic may be greater or less. This test was applied to the case in hand. The bright metallic copper, after a few moments boiling it, was placed in contact with a portion of the tissues of its contents treated as just described, and assumed distinctly the grey color of steel. A portion of

this copper cut from the slip, was heated in a tube of glass, whereby the grey coating was immediately transferred from the copper to the glass, lining it with a similar metallic mirror to those which had been previously produced in the tubes before described. This coating derived from the copper, gave all the reactions which have been described as peculiar to arsenic.

It is well known to chemists, that metallic arsenic, when heated in contact with the air, burns with a peculiar odor, which is described as the garlic-like or alliaceous odor. This character is much insisted upon by some writers on medical jurisprudence, as one of great importance. I obtained the garlic like odor, as well from the metallic grains found on the coats of the stomach, as from the yellow precipitate obtained from dissolving the substance of the organ itself.

It was deemed unnecessary, after the very sufficient and convincing testimony already obtained, to resort to any of the numerous and less satisfactory means known to chemists for the detection of arsenic.

The production of the metallic ring; its entire volatility by heat; its conversion, by the aid of heat and air, into brilliant white octohedral crystals; the further transmutation of these, by means already described, into yellow orpiment; the solubility of this yellow substance in ammonia; its reproduction, unaltered, upon evaporation of the ammonia; and finally the reconversion of this yellow substance, by reducing agents, into the original brilliant metallic mirror, forms a chain of consecutive evidence of the most satisfactory character, and such as can be produced by no other substance in nature than arsenic.

I should regard the production of the metallic mirror of the alliaceous odor, and of the white crystalline grains found on heating the black mirror, a sufficient and irrefragable proof that the suspected substance was arsenic.

I am satisfied, as the result of my research in this case, that death was produced by the administration of metallic arsenic, otherwise called cobalt or fly powder.

I was unable to form any opinion as to the quantity of metallic arsenic present in the stomach.

There is evidence on record that life has been destroyed by arsenic administered in doses of from three grains to as many ounces. It would probably require a greater quantity of cobalt than of the white arsenic to destroy life, since it is only the small part of the metal, which has become partly oxydised, which acts as a poison. It is remarked by writers on medical jurisprudence, that a frequent symptom from poisoning by arsenic is the secretion by the stomach of a dark brownish chocolate-like fluid, which is not unfrequently ejected by vomiting, and which is found in the stomach and intestines on a postmortem examination.

It is a well known property of arsenic to act as a preservative of animal matter. Its antiseptic properties are so strong that in many cases of poisoning by this substance, the stomach and organs of digestion have been found in a perfect state many months and even years after interment.

The medical testimony in this case is less satisfactory than the chemical. The patient had been unwell for some days with symptoms supposed to be occasioned by simple derangement of the bowels, accompanied by nausea and vomiting. The medical attendant was called on Thursday evening, Aug. 30, and found the patient in bed. He complained of nausea, thirst, and constant distress at the stomach, and pain in his bowels; pulse feeble and irregular; his hands cold. He was treated with Hopkins's elixir, followed by Dover's powders, camphor gum and sudorifics. The following day he appeared easier, and was in a perspiration. Still complaining of his stomach, an emetic was administered of ℞. Antim. tart. grs. ii., pulv.

ipecac grs. xx.; which, failing to act, was repeated—each in three doses.

He was not seen again until nine o'clock on Friday night, when he was in a state of collapse, with great distress in the stomach and great difficulty of breathing; pulse not perceptible; hands and feet cold and livid. He complained of extreme heat in the pit of his stomach, and conversed with difficulty; had a constant disposition to vomit, general twitching of the muscular system, and frequent alvine discharges; countenance pallid; skin cold and bedewed with a clammy sweat. Diffusible stimulants were administered, and he died about midnight following, say thirty-six to forty hours from the time he was first seen by a medical attendant.

The autopsy detected nothing remarkable in the upper viscera. The stomach, however, showed distinct marks of inflammation, by a medial ring of vermillion red, extending around it; below—say three-fourths of the organ—was dark, nearly black, colored; the upper portion healthy. It does not appear that the alimentary canal was examined. The appearance of the stomach, when opened, has already been alluded to.

We certainly cannot fail to recognize here several of the main features of arsenical poisoning, but of a comparatively mild type. It is not stated whether there was injection of the conjunctiva, and no medical attendant was present during the three or four hours immediately preceding death. We are not able, therefore, to decide whether tetanic convulsions were developed. Nor indeed are these by any means universal in arsenical poisoning, although frequently present. The "muscular twitchings" however, recorded in the testimony, look that way. No mention is made by the medical attendant as to the nature of the matter vomited—but judging from the abundance of the dark brown tinted matter, mixed with mucus, which I found in the stomach, we cannot doubt that this

matter was also ejected. This case presents, then, the the following train of symptoms, all indicative of arsenical poisoning, viz: Faintness; depression; nausea, with intense burning pain in the pit of the stomach; constant thirst; pain more intense at the close; pulse very feeble at first, and wholly imperceptible at last; diarrhea; muscular contractions, or twitchings; difficult respiration; cold and clammy skin in the collapse; and brown turbid secretion in the stomach.

It is doubtful, on a review of the symptoms, whether any characteristic symptoms is wanting; and, certainly, when taken in connection with the chemical evidence, there can be no doubt that death was occasioned in this case by metallic arsenic.

Louisville, Ky., Dec. 19, 1849.

REVIEWS.

Art. V.—*A Treatise on the Diseases of the Bones.* By Edward Stanley, F. R. S., President of the Royal College of Surgeons of England, and Surgeon to St. Bartholomew's Hospital. Philadelphia: Lea & Blanchard. 1849.

In our former notice of this valuable book, we reached the section on suppuration. On this interesting subject, Mr. Stanley is very lucid and practical, and his remarks and facts deserve the attention of the general practitioner. We shall endeavor to present our readers with the principal matter of his remarks on this subject.

Suppuration in the bone is conveniently distinguished into the circumscribed and diffused abscess. The circumscribed abscess is usually situated near to, or within the articular ends of long bones; but it is sometimes formed in the middle of their shafts. "Generally, at the seat of the disease, the coverings of the bone are tender, a constant aching is felt in the bone, with paroxysms of acute pain and severe constitutional derangement. In some instances there is a remission of the symptoms so complete, and for such a length of time that the patient seems to be well: but the pain in the bone, from the confinement of matter within it, has returned." In one instance Mr. Stanley traced the remission of the symptoms to the formation of a passage in the wall of the abscess, permitting the escape of the matter from the interior of the bone into the parts around it. In some instances a circumscribed abscess enlarges much beyond the natural limits

of the bone. This is in consequence of the combined actions of absorption on the inside of the abscess, and of osseous deposit on the outside, and the osseous walls may acquire any degree of thickness according to the predominance of absorption in one direction, or of osseous deposit in the other. In the museum of the Royal College of Surgeons in Edinburgh, there is an instance of a large osseous cyst originating in the head of the tibia the walls of which are more than an inch thick. A circular aperture, about an inch in diameter, extends through the wall of the cyst, into which the patient used to introduce a wooden plug, and withdraw it to allow the escape of matter, on feeling pain from distension of the cyst. In this way, from sixteen to twenty-four ounces of purulent fluid were every day discharged from the cyst." "Another osseous cyst, in the same museum, within the lower part of the femur, is twenty inches in circumference."

"A diffuse suppuration through the cancellous and medullary tissue of bone is usually a most formidable disease, leading to destruction of the bone and of the soft parts around it, with the most severe constitutional derangement."

The usual causes of suppuration in bone are local injuries, long exposure to cold and moisture, fever, sloughing of the soft parts, after amputation, and compound fractures. The general practitioner should remember the fact that suppuration may take place in the medullary tube of a bone involved in compound fracture, and should also remember that such an evil is scarcely possible, if the proper application is attended to. A contemplation of the disasters that attend suppuration in the bone should lead the judicious practitioner to take care that the evil shall not come from mal-practice.

Suppuration in bone may end in necrosis, and the evidence that the necrosis is from that cause, is "the deposit of purulent fluid or lymph within the bone, which

is not a character of necrosis arising under any other circumstances."

The diagnosis of suppuration in bone is somewhat difficult. The distinctions between the neuralgic affection of bone, inflammation of its tissue, and suppuration, are not so perfect as to secure the physician against error. The necessity for correct diagnosis is obvious from the fact that perforation of the bone must be resorted to in order to remove the purulent collection. The symptoms accompanying the circumscribed abscess in bone are not in general such as bespeak the nervous or hysteric character of the disease, but, Mr. Stanley says, we must not too confidently rest upon this.

Inflammatory affections of bones most frequently arise in the shafts of the bones, while the circumscribed abscess rarely occurs elsewhere than in their articular ends. But Mr. Stanley points out a difficulty here that should not be forgotten. He says: "Part of the shaft of a long bone has gradually enlarged from inflammation in its tissue; then upon the occurrence of a fresh paroxysm of inflammation, increased swelling of the bone has ensued with such severity of pain as to have led to the supposition that there must be matter confined within it." These symptoms may arise from tension and stretching of the inflamed periosteum over the swollen bone.

In the commencement of the remarks on the treatment of suppuration in bone, Mr. Stanley very properly pays a well merited tribute to Sir Benjamin Brodie for "ascertaining the circumstances which indicate the confinement of a small quantity of matter in a circumscribed cavity within bone." By applying this knowledge in perforating the bone, and "thus obtaining an outlet for the matter with immediate and complete relief," Sir Benjamin has saved limbs, which, without this improvement in surgery, would have been consigned to the amputating knife.

In applying the trephine for the evacuation of pus

from bone, the rule is to select the chief seat of pain as the place for the use of the trephine. After this instrument has penetrated as far as the judgment of the surgeon may decide prudent and necessary, if no matter should appear, the cancellous texture should be pierced with a small perforator, around the opening made by the terphine. It must be remembered that the smallest quantity of purulent fluid confined within a bone has been the source of very severe suffering; and, when mixed with blood, which generally escapes freely from the inflamed cancellous texture around the abscess, the purulent fluid might not be distinctly recognized. The character of the fluid escaping from the bone should, therefore, be closely scrutinized. The application of these principles to collections of matter in the bones of the cranium requires great care and judgment. Mr. Abernethey's high authority may easily lead the practitioner into difficulty, for symptoms that may be supposed to denote the existence of pus in the diploe may arise from inflammation of the membranes of the brain. Even in cases of purulent accumulation in the diploe, seen by Mr. Stanley, where the trephine was used, it was of no avail; the accompanying inflammation in the membranes of the brain proved fatal. Suppuration in these bones, and necrosis require careful management. An expectant treatment is the proper one.

From the masterly exposition of the subject of suppuration in bone, Mr. Stanley passes to caries, in which term is expressed those changes that are consequent on chronic suppuration in the cancellous texture of bone.

Caries is distinguished into the simple, scrofulous, syphilitic, and phagedenic varieties. It ensues from comminuted fractures of the cancellous texture, or from such injuries as the crushing of this texture by a bullet; it also ensues from the influence of the scrofulous diathesis, and from the action of the syphilitic poison; and there are cases of it not referable to any distinct cause.

We quote Mr. Stanley's description of the phenomena of caries. He says, they are: "inflammation extending from the bone to its investing soft parts, these become swollen, thickened, and tender; abscesses are formed in them, which contract into fistulous passages leading to the diseased bone. The periosteum covering the diseased bone becomes thickened, very vascular, and readily separable from it. The bone itself is at first very vascular, then its cells become filled with a reddish brown fluid, apparently a mixture of blood and pus, and occasionally combined with oily particles. Absorption of the bone, but chiefly of its animal part, ensues; that which remains is porous and fragile, and of a grey, brown, or black color, probably from decomposition of the matter within its cells; to which cause, likewise, the fetid odor of the matter discharged through the fistulous passages may be ascribed. The diseased bone may gradually disappear, either by ulceration, or by its discharge in fragments through the fistulous passages in the surrounding soft parts. Ulceration, in some instances, commences within the bone, hollowing it out, and reducing it to a thin shell; in others, the ulcerative process commences in the outer surface of the bone, and extends progressively inwards. Whilst these changes are in progress, granulations, very loose and spongy, and bleeding on the slightest touch, often arise from the diseased bone, filling the cavities in its interior, and protruding through the fistulous passages in the soft parts covering it."

But in bones that are deeply situated, caries is often accompanied by very little evidence of inflammation, either in the bone or investing soft parts. Thus the scrofulous caries of the spine often advances to the destruction of the bodies of many vertebra, without tenderness in the bones or in the soft parts investing them.

The difference between caries and circumscribed abscess is tolerably well marked. Circumscribed abscess is rarely followed by the formation of a fistulous channel

in the walls of the bone and adjacent soft parts, affording outlet to the matter. In caries and internal necrosis, such a channel is almost invariably formed in the walls of the bone and their investing soft parts; through which channel, in caries, matter is discharged from the diseased bone; and in necrosis, from the inflamed cancellous texture around the dead bone.

The diagnosis between caries and internal caries is not well marked, and practically it is not important that it should be. The object of the treatment is the same in both cases—the removal of the diseased, or dead bone. Caries and necrosis often exist together in adjacent portions of bone, as in the instances where suppuration ensues in the cancellous texture adjacent to dead bone. The portion of bone which has been long carious often perishes, and thus the caries becomes changed into necrosis. These circumstances lessen the value, says Mr. Stanley, of a diagnosis of these affections by their external character.

Inflammation precedes suppuration and the consequent disorganization of the cancellous texture of bone which constitute caries. The inflammation is of a languid character, and though depletory remedies will not arrest the inflammation, they are serviceable by diminishing the inflammation of the soft parts around the diseased bone.

Nature does much for the relief of caries, and but few cases occur in surgical practice that require the exercise of a finer judgment than caries of the various bones. For instance, when the astragalus is in a carious condition, it is difficult to determine whether the disease is confined to it, or has extended to the adjacent bones and soft parts. Similar difficulties present themselves in caries of the cuniform bones. Internal necrosis and circumscribed abscess in the tarsus present similar considerations. Such cases present the same thickening of the surrounding soft parts, and fistulous passages in them are observed as in

caries. The difficulty is to determine how far the diseased action extends. Most of the operations for the removal of carious bone occur in the hand or foot; and in the performance of them the endeavor should be to remove no more bone than may be unsound.

Incisions through the soft parts over carious bone are of use in affording free outlet to the matter, and thus checking its diffusion through the bone. Local applications to carious bone must be of a soothing character. Stimulent applications will do no good, and may produce fresh attacks of inflammation in the bone and thus extend the caries.

There are cases of caries not suited to any operative proceedings. Peculiarities of constitution, and old age are the points to be considered in such cases. Depletory and sedative remedies, constitutional and local are applicable here, and iodide of potassium is useful in arresting the inflammation of the periosteum, covering the diseased bone. Quietude is of great value in all cases of caries, and its necessity cannot be too forcibly impressed upon the mind of the patient, nor too rigorously enforced by the surgeon.

Ulceration of Bone.—Under this head we find little that is beyond what has been recorded by Hunter, Weidman, and others, and we shall not dwell upon the characteristics of the disease. The treatment recommended by Mr. Stanley is practical and as useful perhaps as any that has been presented to the profession. The local remedies should be of a soothing nature, but sometimes astringents and mild stimulants are serviceable for the promotion of the growth of healthy granulations from the bone. Strongly stimulating applications to ulcerated bone are objectionable, as they are likely to excite fresh attacks of inflammation in the bone, and may thus change the character of the disease, by giving rise to caries or necrosis in the ulcerated bone. Mr. Stanley says: "It is not to

be doubted that a powerful counter-irritant, as the moxa or caustic issue, applied to the integuments over a joint, the bones of which are ulcerated, can arrest the ulcerative process." "It is certain, that in ulcerative disease of the bones of the spine, as also in joints, a powerful counter-irritant will rid the part of the severe pain which characterizes the ulceration of bone in its active form."

It may not be amiss to call attention to a state of things, in which symptoms of inflammation of the bone are so well simulated that an unpracticed mind might be led into a serious error. A man in apparent health is suddenly seized with an excruciating pain in the hip-joint. Every attempt at sneezing or coughing produces such an amount of suffering in the joint, that the patient sedulously guards himself against everything of the kind. We have seen this form of disease occasionally in Louisville, and have often witnessed the severe trials of the sufferer in his attempts to prevent sneezing or coughing. We are indebted to Mr. Abernethy for a description of this disease. There is really no affection of any of the parts of the joint—the derangement is in the stomach, and that organ, instead of complaining itself, makes the hip-joint express the suffering. Mr. Abernethey's invaluable treatise on the "Constitutional Origin of Certain Local Diseases," reveals many singularities of this kind, and shows the proper treatment for such a case as we have described. A simple emetic is usually sufficient for the relief of such a case, but sometimes, an alterative course of blue pill is necessary to accomplish permanent relief. The emetic, however, removes the pain in the hip instantaneously, and we have seen all traces of suffering disappear as soon as nausea was produced.

In our regular analysis of Mr. Stanley's admirable work, we have reached the subject of necrosis, a theme better calculated than almost any other to excite the admiration of the surgeon, and to demand the use of his

contemplative powers. The chemist, ardent in the love of his science, proud of its great achievements, its wonderful progression, and bewildered by what it has accomplished, sometimes permits himself to fancy that the object of his devotion may yet succeed in making all the materials useful to human life, from the elementary substances of which they are composed. The physiologist in contemplating the reproductive powers of the vital principle in animal life; in watching the curious methods by which nature regenerates parts that have been destroyed, may be almost excused if he indulges the fancy, that, in the future progress of science, vital processes may be better understood than at present, and that an art may be discovered by which the various organs and tissues of the system, as they wear out by action, may be rejuvinated and presented to the vital power for a new race in existence. The vital principle never grows old; it tenaciously adheres to its connection with organism as long as the material is susceptible of its impressions.

In surveying a subject of such importance as necrosis much useful matter relative to practical points in other subsystems, beside the osseous one, must spring up in the mind of the attentive student. While we narrowly survey nature in her connection with necrosis, inspiration may be caught from her processes for a widely extended use of the lessons thus taught. The whole realm of nature belongs to the physician, and he alone is accomplished in his science, who has made an intimate acquaintance with that extensive domain. All the sciences are the servitors of medicine, and he is most wealthy in the treasures of healing knowledge, who has the largest number of these servitors usefully employed. But we must proceed with the subject of necrosis.

Mr. Stanley says: "Necrosis of the shaft of a long bone in the ordinary mode of its occurrence, is an example of the simple death of bone without change in its

structure; but when necrosis has been preceded by chronic inflammation, the dead bone will be hardened; or after other diseased changes, it may be soft and fragile."

"Dead bone usually presents a yellowish white color, consequent on the blood being withdrawn from its vessels, but it often becomes of a brown or black color. The color of a dead bone appears to be influenced by its exposure to the atmosphere. It is often brown or black to the extent only that it is uncovered; the change of color does not extend below the surface of the bone, except in the instances of its texture being porous."

The portion of bone usually affected with Necrosis.—Necrosis occurs less frequently in the cancellous than in the compact tissue of bone. Owing to this resisting power in the cancellous texture, rising from greater vital endowment, necrosis in the shaft of a bone, *rarely* extends to its articular ends.

Bones most generally affected.—The tibia is more liable to necrosis than any other bone, and the liability of the other bones is in the following order; the femur, the humerus, flat cranial bones, lower jaw, last phalanx of the finger, clavicle, ulna, radius, fibula, scapula, upper jaw, pelvic bones, and the ribs. An attention to this order of liability to necrosis may give some aid to diagnosis. A certain class of symptoms occurring in the tibia would lead the surgeon to suspect necrosis more readily than if those symptoms presented themselves in connection with the ribs. The tibia appears to be the most general point for invasions of disease. Necrosis is of frequent occurrence in the cancellous texture of the head of the tibia, so frequently, indeed, that there seems to be something in the structure and functions of the head of that bone which especially disposes it to the invasion of disease, for here not only necrosis, but also abscess makes its attack, and here, also, the malignant affections of bone are frequently developed. This fact, to which the records of medicine

furnish a cloud of witnesses, should teach the surgeon a practical lesson in selecting his point for an amputation of the leg. There is a strong disposition on the part of the surgeon to save the knee joint to aid the use of an artificial leg, but we cannot help thinking this is misplaced kindness. All scientific manufacturers of artificial legs know that they can make a limb of this kind much more comfortable and useful when the amputation is made above the knee than when it is below it. When the tibia and fibula lose that *point d'appui*, they had in the ancle joint, their presence in the stump is a serious evil; they grind and annoy the soft parts, and give scarcely any support to the knee joint; none indeed that compensates for their presence. The weakest point in the system for the invasion of disease of the bones, in this state of things, presents additional facilities for disease. In view of all these facts, we think that amputations of the leg, should, as almost a universal rule be made above the knee.

Causes of Necrosis.—"The recognised causes of necrosis are cold, injury by violence, rheumatism, scrofula, syphilis, and fever. Some of these causes act directly on the periosteum; others on the medullary tissue; and others on the bone itself. All these tissues may be affected by inflammation in a case. Paronychia, followed by necrosis of the last bone of the finger, probably commences in inflammation of the periosteum." Of this fact, stated by Mr. Stanley, we think there can be no doubt. We do not remember any case that has come under our observation, in which the peculiar odor belonging to suppuration of bone was manifested in the first discharge from a paronychia, and in which the pus was not devoid of the usual appearance of that arising from inflammation of the osseous tissue.

In addition to the causes of necrosis mentioned above, Mr. Stanley calls attention to certain occasional agencies that come into play. Salivation is probably the most fre-

quent cause of necrosis in the lower jaw. Another of these occasional causes of necrosis, both in the upper and lower jaws is connected with the manufacture of lucifer matches. Phosphorous acid vapor is the poisonous agent in these cases. On this subject a volume of testimony has already accumulated, and the disastrous effects have been seen so often, that this necrosis assumes an important position. Why the phosphorous acid vapor acts especially on the jaw bones is a matter for investigation. At present we can give no more reason for it, than for the fact that in arsenical poisoning, from a local application to the extremities of the body, ulcerations are found in the stomach just as they are when the poison is taken directly into that organ.

While speaking of the agency of the phosphorous acid vapors in producing necrosis of the jaws, Mr. Stanley states some facts that are of interest upon a Western subject. We allude to the cause of milk-sickness. With a laudable solicitude for the advancement of medical science, in the mitigation or removal of human suffering, some well informed medical men have investigated the effects of arsenic upon dairy animals, under the impression that milk-sickness was caused by arsenical vapor. But the facts detailed by Mr. Stanley show that this is an error. At the copper works at Swansea, where copper is melted, arsenical fumes are evolved to such an extent as to destroy all animal and vegetable life within their influence. Cows, in that region, become disabled from disease in the bones, a fact which has never been noticed as an attendant upon the disease in those animals which were distinctly recognized as the source of milk-sickness in the human subject.

But that phosphorous acid vapor should display its poisonous energies in producing necrosis of the maxillary bones, and that arsenical fumes should direct their powers on the general osseous system, enlarging the bones,

and covering them with deposits of unhealthy osseous matter, are curious facts that need elucidation.

But we must examine now into the action of the causes of necrosis we have mentioned, especially in its attacks upon some of the small bones. The tuber ischii, or the trochanter major are destroyed with their soft coverings, in feeble systems, from inability to sustain the pressure to which the parts are subjected.

In scrofulous children, necrosis occurs in portions of bones having a cancellous texture ; but in these instances the death of the bone is usually preceded by suppuration through its cells.

Syphilis produces its effects mostly on compact osseous texture, and in portions of bones which have their soft coverings, as the flat cranial bones, the front surface of the tibia, and the posterior border of the ulna, near the olecranon. Syphilitic poison produces the immediate and complete death of the surface of the bone it attacks.

Rheumatic inflammation of the periosteum is another cause of necrosis in small portions of bone. This most frequently occurs in the periosteum of the trochanter major, and adjacent parts of the neck and shaft of the femur. Here suppuration may assume a formidable state of things, by the matter bursting into the hip-joint.

Fistulous passages.—In many instances of necrosis attacking small portions of bone, it is not possible to make out satisfactorily the history of the disease, in respect to the cause of the death of the bone. The common feature, however, of all these cases should be impressed upon the mind—the existence of one or more fistulous passages in the soft parts, often circuitous in their course, the orifices of which in the integuments are often at a great distance from the piece of dead bone to which they lead.

A fistulous passage in the soft parts adjacent to dead bone, whether this be superficial or deep, is an almost unvarying occurrence. In superficial necrosis, abscess

forms in the adjacent soft parts, and the matter tracks its way to the integuments, through which it is discharged, the abscess then contracting to the fistulous passage which leads to the dead bone. In deep necrosis, implicating only the inner lamella of a bone, a fistulous passage is formed, first in the adjacent walls of the bone, and then in the soft parts covering it. This is the usual course of things, but enough departures from it have been noticed to show that we must be guarded on this point.

Symptoms of Necrosis.—When necrosis occurs in the outer lamella of a bone, it is not easily distinguishable from other inflammatory affections of periosteum or bone. The phenomena ordinarily attendant on its progress are: separation of the periosteum from the dead bone; inflammation of the periosteum, followed by suppuration beneath it, and by ulceration of it with the investing soft parts, affording outlet to the matter, and terminating in a fistulous passage leading to the dead bone.

Necrosis in the inner lamella has its characteristic signs. The first symptom, generally, is pain deep in the bone, but sometimes, fever, continuing many days or even weeks, and then subsiding, with the commencement of pain in the bone, is the first symptom. The death of the inner lamella is followed by suppuration in the adjacent cancellous texture, also by the formation of a narrow fistulous passage in its walls. While these changes are going on within the bone, inflammation arises in the soft parts covering it, accompanied by a soft circumscribed swelling of the integument, from which, when punctured or allowed to burst, matter will be discharged. Through the abscess in the soft parts, the orifice of the fistulous passages may be detected, but it may be so small as not to be found, which may lead to difficulty in determining the real nature of the disease. Mr. Hey was led to suspect an aperture in the walls of the bone from the amount of

matter discharged, being greater than the surface of the outer wound should have furnished, and Mr. Stanley says his observations have enabled him to confirm the value of the suggestion.

Necrosis of the shaft of a bone in its whole thickness, whether in a part of its length, or occupying the whole of it, presents the following features: in some instances febrile disorder precedes the death of the bone, but generally a sudden attack of pain deep in the bone is the first symptom; this is quickly followed by excessive inflammation in the soft parts, accompanied by fever. As soon as the necrosis occurs the periosteum loses its hold on the bone, and when separated from the bone, the periosteum becomes acutely inflamed. The inflammation extends through the other tissues to the integuments where it presents a phlegmonous or erysipelatous character. The terminations of this inflammation may be serous effusion, attended with mere enlargement, or in the deposit of fibrin consolidating the textures, or in suppuration beneath the periosteum, and in the intermuscular cellular tissue giving rise to one large abscess, or to many small ones in different parts of the limb. Incisions are usually required for the discharge of the matter from these abscesses; and then, unless there is an unusual source of irritation maintaining the suppuration, the quantity of matter secreted will gradually diminish, and some of these passages will be closed, whilst others remaining fistulous will lead to the cavity in which the dead bone is enclosed.

Necrosis in the shaft of a bone, through the circumference and thickness of its walls, is usually accompanied with the death of its medullary tissue to a corresponding extent. But there are instances of necrosis arising only on the surface of the bone, in which the walls of the bone perish, while the medullary tissue preserves its vitality.

Necrosis of the shaft of a bone near its articular end is often followed by the extension of inflammation to the

adjacent joint: thus, disease in the knee-joint has ensued from a necrosis either in the femur or tibia near its articular end. And destruction of a joint may occur from necrosis, by the abscess in the soft parts around the dead bone, bursting into the joint. Attention should be directed to these cases. Amputations have been performed for diseases of the joints, and they might have been avoided if it had been known that a small piece of loose bone, imprisoned within the living bone, was near the joint, and could be removed, by which the limb might have been saved.

When the necrosis is of small size, or only a small part of the bone has perished in a patient who is not of an irritable habit, the inflammation in the soft parts is apt to be of a mild character.

Necrosis of a part of the cancellous texture within the articular end of a bone is a formidable disease, as it often destroys the adjacent joint. This necrosis most frequently occurs in the head of the tibia, in persons between the ages of fifteen and twenty years, often without appreciable cause, but most frequently from a blow upon the knee. The great danger here, arises from the inflammation being in the neighborhood of the joint. This point is so important, that instead of giving a mere synopsis of Mr. Stanley's observations, as we have been doing, we shall in this case give way to a quotation from him. He says: "The dead portion of the cancellous texture within the head of the tibia is rarely as large as a hazle nut; its situation varies, being nearer to the front or back wall of the bone, or to its upper articular surface, in one case than in another. The separation of the dead from the living bone usually takes place in an early stage of the disease. The piece of dead bone is then loose in a suppurating cavity, lined by a thick and very vascular membrane, from which pus is secreted more or less abundantly, according to the degree of excitement in the surround-

ing parts. The dead bone, being an irritant, excites constant pain, with successive attacks of inflammation, in the adjacent living bone; also in its periosteum and in the knee-joint. Consequently, the surrounding cancellous texture becomes hardened, and narrow ulcerated passages, which become fistulous, extend in various directions through the hardened bone to the front or back wall of the tibia, or towards its upper articular surface. If these ulcerated passages extend through the wall of the bone to its periosteum, matter will then accumulate beneath the periosteum, or ulceration of the periosteum will ensue, permitting the extension of the abscess into the surrounding soft parts. If one of the ulcerated passages in the bone should extend upwards to its articular surface, and then open into the knee joint, rapidly destructive inflammation of it will ensue. During the progress of the disease, the periosteum investing the head of the tibia and the cellular tissue around it, become thickened and indurated, thus giving to the bone the appearance of actual enlargement."

We resume the consideration of the progressive steps of necrosis.

The term exfoliation applies to that process in bone, which we call sloughing in the soft parts. In both cases, a soft vascular tissue marks the line of separation between the living and dead parts. The granulations in necrosis fit, or are dowelled into small circular holes on the surface of the dead bone. John Hunter investigated the subject of exfoliation as a vital process, and recent investigations with the microscope, have confirmed his observations in a remarkable manner. Chemistry has presented its aid, and it is an important one. Through that aid, we have ascertained the fact that pus discharged from the vicinity of exfoliating bone has in it a large proportion of phosphate of lime. Pus of this kind was found to yield 2.43 per cent. of phosphate of lime, and 2.08 per cent. of

carbonate of lime and soda. Thus in the pus from parts around diseased bone, the phosphate of lime amounted to nearly two and a half per cent., while in pus elsewhere obtained, only traces of phosphate of lime were discovered.

Mode of Removal of Dead Bone.—There are instances in which dead bone disappears without any sensible exfoliation of it. Mr. Hunter's doctrines induced the supposition that this disappearance, under these circumstances, was the result of the action of the absorbent vessels in the granulations adjacent to the dead bone. On the other hand, it is denied that dead bone is ever absorbed into the system. Miescher has made some observations that seem to disprove the fact of absorption. He has shown that there is a process of exfoliation, in which the dead bone is detached in particles so minute as not to be detected by the unaided sight, and which, therefore, has been termed insensible exfoliation. This view accords with the well ascertained fact of there being a larger quantity of the earthy salts of bone in pus obtained from the neighborhood of exfoliating bone, than in pus made under other circumstances.

Mr. Stanley thinks that when the dead bone is extruded from the cavity in which it was lodged, the process is effected by the pressure of the surrounding granulations against the bone. This extension does not always occur, either in consequence of the size of the dead bone, or from its being enclosed within a tube of the newly formed bone. The next question is whether the exfoliating bone remaining within this cavity, can be acted upon and removed by the adjacent living bone. Sir William Blizzard thought he obtained proof of a removing power in the living bone, but his experiments have been repeated often without the results he claimed, and Mr. Stanley's facts, and Mr. Gulliver's memoir on the subject conclusively show that no power is exerted by the living bone

for the removal of the dead one, and wholly disprove the absorption of it. Enfoliated dead bone may acquire adhesion to the living bone: Miesher observed the granulations of the adjacent living bone penetrating the medullary canals of the dead bone.

Exfoliation is variable in respect to the rapidity of its progress, and neither age nor health gives any data on which to found an idea of the time that may be occupied in the process. It commences sometimes and stops without any apparent cause, and sometimes the separation of the dead bone never commences.

Having thus surveyed, through Mr. Stanley's excellent work, the various phenomena that accompany the death of bone, we now turn to the more gratifying contemplation of the efforts of nature at reparation. There is nothing more grateful to the feelings in examining the diseases of the animal economy than a contemplation of these reparative processes, and while following our enlightened guide in these processes, we cannot but regret that one, who has done so much for this whole subject should have failed in any point, and especially in one where the cause of the failure is not altogether obvious. When we reach that point we shall call the attention of the reader to it. We proceed now to consider the reparative processes.

Mr. Stanley says: "If only part of a bone has perished, its remaining portion and the surrounding soft parts become inflamed, and the changes which ensue in these parts constitute the first stage in the process of reproduction. Through its subsequent stages this process is diversely modified, according to the situation and extent of the dead bone, and by other circumstances hereafter to be stated."

"Necrosis in the outer lamella of a bone, when accompanied by destruction of its coverings, including the periosteum, gives rise to the following changes—thickening

and consolidation of the inner lamella of the bone, inflammation of the surrounding periosteum, occasioning osseous deposit beneath the membrane, and in its tissue; and in this way the dead bone becomes circumscribed by a thick projecting border of new osseous substance. In the instances which I have examined, the depression in the surface of a bone, consequent on the exfoliation of its outer lamella, was found filled with fibrous tissue. But in the experiments of Miescher, it appeared that reproduction of the exfoliated outer lamella was effected by ossification of the granulations filling the space between the dead and living bone."

Hunter's experiments on these points were unsatisfactory, because he took pains to do as little injury as possible to the soft parts.

Can the osseous matter of the outer lamella be reproduced without the periosteum? Experiments upon animals show that it can, but Mr. Stanley says, and we believe correctly, "it is doubtful whether in the human subject, the reproductive power of the tissue of bone is adequate to the formation of so great an extent of new bone," (as is required for a shaft of bone). "In the human subject the reproduction of the outer lamella of a bone can probably be but imperfectly, if at all, effected without the aid of the periosteum."

In some cases the reproduction of bone is effected chiefly by the medullary tissue. If the periosteum and medullary tissue are both preserved, in necrosis of the walls of a bone, the reproduction will chiefly ensue from the periosteum.. "When necrosis attacks the inner lamella of a bone, without extending to its medullary and cancellous tissue, the reparative processes which, under favorable circumstances, may ensue, consist in the consolidation, by osseous deposit, of the medullary tissue, in the thickening and induration of the outer lamella, and in

the deposit of osseous substance upon the surface of the bone, beneath the periosteum."

In necrosis of the entire thickness and circumference of the shaft of a bone, through a part or whole of its length, we have to consider four distinct sources of reproduction which may severally be concerned in the formation of the new bone: "these are—1, the periosteum; 2, portions of the original bone detached from its surface and remaining connected with the periosteum; 3, the articular ends of the original bone; 4, the soft tissues around the periosteum, or around the bone if the periosteum has been destroyed. The power of the periosteum for ossification seems to be based on irrefragable evidence. On this point Mr. Stanley says:

"The Italian pathologist, Troja, was, I believe, the first to institute this experiment. I have many times repeated it in dogs, and have thus had the opportunity of observing the phenomena of the reproductive process, which are here enumerated in the order of their occurrence:—inflammation of the periosteum, deposit of purulent fluid between the periosteum and the bone, deposit of gelatinous substance upon the inner surface of the periosteum, hardening and ossification of this gelatinous substance, separation of the dead shaft of the bone from its articular ends, and, lastly, the production of osseous substance from the articular ends, which becoming united with the new bone formed upon the internal surface of the periosteum, the osseous cylinder is thereby completed, and its continuity with the articular ends of the original bone established. Accordingly, in the first stage of the reproductive process, the periosteum is found soft and pulpy, from inflammation of its tissue, and consolidated with the surrounding parts, so as to form with them a vascular bed enclosing the dead bone. Upon the inside of this vascular bed, the new bone is formed. The new bone is lined by a layer of soft and very vascular tissue,

which becomes the medullary membrane, with which, under favorable circumstances, the new bone is provided. Dr. Macdonald instituted similar experiments; but, immediately after causing necrosis of the shaft of a bone, he mixed madder with the food of the animal: and on examing the parts three days afterwards, he found the periosteum thickened, with a deposit of gelatinous substance upon its inner surface, in which there were osseous particles tinged by the coloring matter of the madder."

Of the opposite view, the adherence of bone to the periosteum, as the reproducing power, we shall, at present, say nothing.

"Two other sources of reproduction in necrosis of the shaft of a bone are yet to be noticed; namely, the articular ends of the bone, and the surrounding soft parts independently of the periosteum."

New osseous substance is produced from the articular ends of the original bone, but it is only in sufficient quantities to make their union with the newly formed shaft of the bone. That the soft tissues can become the reproductive power of bone, even when the periosteum, with its nuclei of ossification is destroyed, is evident from carefully arranged facts presented by Mr. Stanley and from the experiments of Mr. Russell, of Edinburgh, and of Dr. Macdonald. The circumstances favorable to this mode of reproduction are, that around the dead bone there should be a thick stratum of soft parts, and that the inflammation shall be mild enough to terminate in the effusion of serum or fibrin, rather than suppuration.

When a bone is reproduced by the periosteum, that membrane encloses it, but where the periosteum of the original bone is destroyed, the new bone has for its immediate investment a thick layer of dense cellular tissue, which answers all the purposes of the periosteum. The new bone possesses the entire apparatus of nutrition, ar-

teries, veins, absorbents and nerves. The compensating powers of nature are very wonderful.

The following facts mentioned by Mr. Stanley are of importance, and will be urged again when we come to speak of the bandage. There is a period in these reparative processes, when the articular ends of the original bone are detached from it, but not yet so firmly connected with the newly formed bone as to resist the action of the surrounding muscles. If these articular ends are suffered to approximate, under these circumstances, and permitted to remain so, the new bone will be defective in its proper length. In some instances this deficiency has been to the extent of several inches. But worse still—a spasmodic action of the muscles around the separated shaft of the bone may force its pointed extremity into a contiguous joint, or into a large bloodvessel. Such accidents have happened, but they are impossible when the bandage is properly used.

"The cases of necrosis most favorable for the reproductive process, are those in which the bone suddenly, and at once, completely perishes, and in which there has been no interference with the consequent inflammation in the periosteum and surrounding parts, constituting the first stage of the reproductive process."

"Reproduction after necrosis in any of the flat bones is rare, in some of them it never occurs. It is doubtful whether any of the short, cylindrical, or irregularly shaped bones are ever reproduced."

"Instances of necrosis in early life have occurred, wherein a small portion of the dead bone, not separated from the living bone, has remained unchanged for many years, and the fistulous passages in the soft parts leading to it have become closed. * * * After a lapse of time, it may be a year or longer, a fresh attack of inflammation, followed by abscess, and the re-opening of the fistulous passages, has shown that the original

source of irritation still existed. As long as the dead bone irritates the adjacent parts into suppuration, the fistulous passages remain open. But a small portion of dead bone may not irritate, and the fistulous passages may close up.

The following list of the least frequent examples of necrosis is given by Mr. Stanley:

Lower Jaw, in a girl aged ten years. The reproduction was perfect. Separation of the ramus with the entire condyle. Perfect reproduction.

Scapula. Chopart reports the reproduction of this bone.

Clavicle. The entire bone was destroyed by necrosis, and a complete reproduction took place. Two cases are reported of this character.

Sternum. Necrosis of a great part of this bone, in which reproduction was in progress.

Femur, necrosis and exfoliation of the neck with the shaft of the femur in a child. The recovery was perfect, with but little shortening of the limb.

Fibula, necrosis of the shaft; reproduction perfect.

The three last instances are from the museum of St. Bartholomew's Hospital, First series, Nos. 63, 204, 158.

We intended to extend the list of reproduction of bones but our waning space prohibits the fulfilment of the intention.

We have now reached Mr. Stanley's observations on the *treatment of necrosis*, and though we must be succinct in this part of our analysis, we shall endeavor to omit no material feature.

The treatment of superficial necrosis divides itself into two considerations: Can we accelerate the exfoliation of the dead bone? or, shall it be removed by operation?

As a general rule the best applications to the soft parts around dead bone are those of a soothing nature. Stimulating applications, of a moderate character are some-

times useful in producing a sufficient excitement to bring about exfoliation, and mercurial ointment, mixed with soap cerate, is recommended by Mr. Stanley. Exercise of the muscles of the limb, in which the necrosis is situated, is another means of expediting exfoliation. The observations of Mr. Stanley have not induced him to favor the application of acids to the bone, except in some cases of superficial necrosis. He very properly prefers muriatic acid to the sulphuric. The latter makes sulphate of lime, which is injurious.

The removal of the dead bone by operation is inexpedient where a superficial necrosis occurs in bones with a thin covering, and if, after a considerable time, the exfoliation is not advancing. The extent to which the surface of the bone has perished, is indicated by the extent of the separation of the soft parts from it, but this gives no index as to the depth of the necrosis.

"In internal and deeply situated necrosis, when a probe, passed through the fistulous passage in the walls of the bone, discovers the dead bone to be loose, the removal by operation is expedient, and this may be the case even when the dead bone is not completely separated."

If the fistulous passage in the walls of a bone leading to the perished portion of its inner lamella or cancellous texture, is of sufficient extent, the dead bone may be extracted through it. The enlargement of the passage is usually requisite, but it is difficult to do it, on account of the long-continued irritation of an internal sequestrum having thickened and indurated the walls of the bone.

In superficial necrosis, the first thing to be done is the division and separation of the soft parts sufficiently to effect the removal of the dead bone.

In internal necrosis, the hole already existing in the walls of the bone should be the centre of the incision through the soft parts, the requisite portion of the walls

being removed by a trephine or other suitable instrument. No more of the wall should be removed than is sufficient to allow the removal of the sequestrum. An aperture of no great size may be sufficient for the removal of a large sequestrum, provided it be conveniently situated for cutting forceps. Heuteloup's stone-crushing forceps, and Civiale's branched stone-perforator have been used with advantage for breaking down the sequestrum.

In necrosis of the shaft of a bone, in its first stage, the treatment must be directed to the control of the inflammation in the surrounding soft parts. The effusion of serum or fibrin is preferable to suppuration, and the inflammation should be confined to the neighborhood of the dead bone, and especial care must be taken that it shall not extend to any of the contiguous joints. Mr. Stanley recommends quietude, the local abstraction of blood from the parts by leeches, and it may be necessary to give saline and antimonial medicines. Poultices and fomentations are also recommended. Although it has been lately uttered to the world that inasmuch as "none but a great poet can criticise a great poet," and this fresh and valuable literary discovery is made the basis of the law, that none but one thoroughly acquainted with surgery must criticise surgical doctrines and practice, we must beg leave to suggest from experience, that quietude, and the proper use of the bandage are worth all the rest of Mr. Stanley's treatment, for the object in view.

If suppuration takes place, and it is generally indicated by shiverings, free incisions must be conveniently made for the escape of matter.

"If there should be constant pain deep in the limb, with occasional attacks of inflammation in the surrounding parts, counter irritation, by an issue, is then indicated —and it may be required as long as the dead bone remains.

The next question is upon the circumstances that make

it expedient to resort to an operation for the removal of the dead bone.

When the shaft of the bone is separated from its articular extremities, the formation of the new bone is, in general, so far advanced that the dead bone is enclosed in an osseous case. Absorption was formerly relied upon, for the removal of the dead bone, but since it has been shown that the absorption of exfoliated bone is not a tenable doctrine, the consideration of a resort to an operation is important. An operation should be deferred until there is an assurance that the dead bone is loose. The exfoliated bone may be fixed by the surrounding granulations being imbedded in the excavations of its surface.—Dupuytren advises that with the end of one probe resting against the dead bone, a second probe be introduced into another of the fistulous passages, and its end pressed against the dead bone: if there be mobility, it will make itself evident by the impressions communicated through the probe first introduced. Care must be taken in making incisions through the indurated parts, and as little of the walls of the new bone as possible must be removed.

Necrosis of the cancellous texture of the head of the tibia may demand an operation. This should be resorted to as early as may be practicable, because the knee-joint is in danger. But difficulties may arise. The piece of dead bone may be so near the upper articular surface, that its removal would not be practicable without opening [the joint. And it is often impossible to decide upon the precise locality of the dead bone. If the knee-joint should be suffering seriously, amputation may be better than an uncertain operation on the head of the tibia.

Among the long bones, operations for the extraction of dead parts of the shaft, are in general performed with the least difficulty upon the tibia. The operation is usually undertaken before the new bone is completely form-

ed, and it be necessary to separate only some narrow, bridge-like portions of the new bone.

Operations are required in the humerus occasionally, for the removal of dead and exfoliated portions of its shaft, but it is unnecessary for us to describe what must be already understood by our readers.

In necrosis of the lower part of the femur, just above the condyles, we meet with great difficulties. The thickening and consolidation of the soft parts around the bone, the changes in the bone itself, the inflammation of the knee-joint, the danger of wounding the femoral vessels in attempting to use the fistulous passages as guides for incisions to the dead bone, constitute a state of case where amputation may be a less evil, than an attempt to remove the dead bone.

We referred to one point in which Mr. Stanley had failed in his observations on necrosis. He very strangely says that in necrosis of the first and second phalanx of a finger, or of the ungual phalanx, the soft parts should be opened, and the dead bone removed, but that *the bone will not be reproduced.* We cannot conceive a reason for such a statement. All the conditions of reproduction are present—we have periosteum, an articulatory end of bone, and a sufficiency of soft parts, and why is it, that while from the presence of any one of these sources of reproduction elsewhere, we might reasonably look for reparative action, we must not expect it in a case where all three are present? In cases of this kind emollient poultices are generally recommended, after the removal of the dead bone, and a suppurative action is established, which defeats the reparative process. The application of the bandage to the finger or toe, so as to limit the inflammation to a regenerative power, will reproduce bone in these cases, as certainly as it is reproduced in any other part of the system. We speak from a tolerably ample experience, when we say we have never failed to reproduce

bone in the phalanges of the fingers. In applying the bandage we must be careful that in the attempt to reproduce bone, we do not make the finger too long nor too short. A little care will secure all the desired benefits.

We have thus moved with Mr. Stanley through the whole of the subject of necrosis, and have found the occupation a pleasant one. Our companion is one of those practical and useful investigators who advance the interests of a profession which is identical with the interests of humanity. He has illustrated the various principles, observations and facts we have quoted from him, by a multitude of interesting cases, which demand the study of the physician.

We have many more valuable things to present our readers from Mr. Stanley's work, but we must defer the pleasure to another time. But we beg leave to call the attention of Messrs. Lea & Blanchard to the necessity they should feel for publishing Mr. Stanley's plates, twenty-four in number, as an accompaniment to this work.—The medical public in this country will feel indebted to them for a publication of such value. Indeed, without it, Stanley on Diseases of the Bones will be what Malte Brun's geography would be without an atlas.

Art. VI.—*The Three Kinds of Cod-Liver Oil; comparatively considered, with reference to their chemical and therapeutic properties.* By L. J. de Jongh, M. D., of the Hague. Translated from the German, with appendix and cases, by Edward Carey, M. D. To which is added an article on the subject from "Dunglison on New Remedies." Philadelphia: Lea & Blanchard.

Dr. Jongh has investigated the chemical and therapeutic properties of the different kinds of cod-liver oil with a great deal of patience, skill and judgment; much more, indeed, than are usually brought to bear on such

subjects. We wish that we could feel the same degree of confidence in Dr. Jongh's testimony to the therapeutic properties of the three kinds of cod-liver oil, that we do in his chemical evidence. The researches of the laboratory may be more accurate, unvarying and satisfactory than the reports of the success of a popular medicine in various forms of disease. But while we must hold many of the statements of Dr. Jongh on the therapeutic value of cod-liver oil, *sub judice*, we feel it incumbent on us to let our readers know what he says. We shall not, however, attempt to carry them a wearisome journey through the chemical paths of the subject, but shall confine our notice to the diseases said to have been cured by the cod-liver oil. These are the details most likely to interest our readers.

Cod-liver oil was known, as a medicine, to Dr. Percival as early as 1771. It was then used for chronic rheumatism. From that time, down to 1822, occasional notices of it occur, but Schenk, who published his report of sixteen cases of rheumatism, cured by this remedy, enjoys the honor of having brought the subject fairly before medical men. In 1826, Schenk reported twenty other cases, which excited much attention. From his observation and experience, he believed the cod-liver oil as much a specific in rheumatism, as quinine is in ague, or mercury in syphilis. From the time of Schenk's publications, down to the present time, hosts of medical men have borne strong testimony to the remedial powers of cod-liver oil. The best effects, after the failure of all other remedies in many cases, are reported in the following forms of disease: rickets, scrofulous caries, fungus articularis in a scrofulous diathesis, rheumatic palsy, pædarthrocace, scrofulous abscess, with extreme emaciation, exostosis with a scrofulous taint, sciatica, and coxalgia. In 1833, Hankel discovered its virtues in tuberculous phthisis, and a great deal of proof has accumulated since,

in favor of the employment of the remedy in this disease. Cardialgia and hemicrania of a rheumatic character, we suppose, were relieved by the cod-liver oil, after they had resisted all other remedies. In herpes, and scrofulous eruptions generally, this medicine was found efficacious. Smeet says that a combination of cod-liver oil and hydriodate of potash, renders all other medicine superfluous in confirmed tubercular consumption.

A great deal of evidence is brought forward to show the vast superiority of cod-liver oil over all other remedies in rheumatic and scrofulous disease. In scrofulous ulcers, used externally, this oil is said to have shown great restorative power. In osteo malacia, carious scrofulosa, and caries of the femur, its powers were very satisfactorily witnessed by many physicians. In tumor albus, an affection involving the ligaments, cartilages, and bones of joints, the reports are very favorable to the use of the cod-liver oil. It is also supposed to exert a beneficial influence over leucorrhea and amenorrhea.

The use of this medicine should be discontinued if indigestion, hemorrhage, or diarrhea should come on during the administration of it.

From an examination of a number of tables carefully prepared, and remarkably well reported, in order to settle the question as to which is the best oil for remedial purposes, it is evident that the brown cod-liver oil cured in half the time required under the use of the other two kinds.

The doses of cod-liver oil for children should be from one to two teaspoonfuls two or three times a day. Adults may begin on tablespoonful doses three times a day, and these may be increased to eight or ten tablespoonfuls a day.

It is difficult to disguise the taste. Peppermint produces eructations which renew the taste of the oil. The medicine should be taken after a full meal, and a little

Madeira wine, taken immediately after the oil, assists materially in making it palatable. Various formulas are reported for giving this oil, but each physician may easily make a preparation for himself. We shall not, therefore, encumber our pages with a republication of any of the formulas given.

We have no doubt that in many of the forms of disease of the bone, which we discussed in the December number of this Journal, and the consideration of which is renewed in this number, in an analysis of Mr. Stanley's work, the cod-liver oil will prove a valuable remedy. In a portion of Mr. Stanley's work, held over for future analysis, that gentleman bears strong testimony to the virtues of cod-liver oil.

We thank Dr. Carey for having introduced the labors of Dr. Jongh to the acquaintance of American physicians, and we indulge the hope that these labors will prove to be valuable.

THE WESTERN JOURNAL.

THIRD SERIES.—VOL. V.—No. I.

LOUISVILLE, JANUARY 1, 1850.

CUI BONO?

The readers of the November number of this Journal will remember that we made some editorial remarks on the subject of the surgical papers of Professor B. W. Dudley. The spirit of those remarks has been misconstrued in the December number of the Transylvania Journal of Medicine, and this misconstruction is made the basis of a violent personal attack upon one of the editors of this Journal. We shall imitate neither the spirit, temper, taste, nor language of this singular article, but we owe it to ourself to say something on the misrepresentation to which we have been subjected. The article to which we allude, represents that we have done some wrong or injustice to Professor B. W. Dudley, but we hold that we are as incapable of doing anything of the kind, as the editor of the Transylvania Journal can be, and this opinion is founded on years of admiration of, and affection for that distinguished personage as a surgeon, teacher, and gentleman. We have no motive to do him wrong, and it would require a more powerful one than we have ever yet felt, to induce such an act. The feelings of veneration, gratitude, and esteem we formed for the Professor many years ago, founded on an intimate knowledge of his character, have undergone no change, and we have some hope that they are immutable.—But it is due to freedom of opinion, to liberty of speech itself, to say

that we are not aware of anything, in the way of position, eminence, age or talent, that places a man beyond the reach of fair and manly criticism, especially when personal regard guides the pen. In the article which has aroused the temper of the Transylvania Journal, we thought we did justice to the eminent character of Professor Dudley as a teacher and surgeon, and did not for a moment suppose that we were committing a heinous offence. What we had to say was expressed in anything but offensive terms; we intended to be decorous and respectful, and we are well satisfied that we did not pass beyond the limits of our intentions.

There was, in our estimation, an indifferent foundation for the assault made upon us, and self-respect prompts us to be careful that we do not build a similar superstructure on a similar basis. We are certain that we do not misapprehend the tastes or interests of the subscribers to this Journal, in supposing that they would be disgusted with personal maledictions, and squabbling on the pages of a work devoted to medical science.

We had hoped for a pleasant intercourse with the Transylvania Journal; we hoped that differences of judgment and opinion would be expressed in terms of professional courtesy, and that the only competition between the two Journals would be found in an endeavor to advance medical science. These hopes have been dissipated, and as we have no kind of desire to maintain such an intercourse as the Transylvania Journal has indicated, we must decline for the future any connection with that Journal.

PROFESSOR BARTLETT'S ADDRESS.

The beautiful and appropriate tribute rendered to Dr. Wells, author of the "Essay on Dew," by Prof. Bartlett, cannot fail to please those who are fond of all that is excellent and becoming in the human character. The English language boasts of no philosophical treatise more perfect in all its details, than the "Essay on Dew," and there are few Americans who read the tributes of admiration, bestowed in European scientific works on that celebrated essay, who are aware of the fact that its author was an American. He studied medicine under the accomplished Dr. Garden, a physician, a scholar, and philosopher. Dr. G. was a favorite of the great Linnæus, and the fragrant plants, called Cape Jessamines, were named Gardenia radicans and grandiflora, in his hon-

or. While breathing the rich perfumes of these flowers, which exhale their sweetness in great power, when the dew is on them, how little did he expect that his young student was to lift the veil, and explain, with perfectness, the whole of those phenomena, which the master had often looked upon through the eyes of Nature's great interpreter, when he says:

> "And that same dew, which sometime on the buds
> Was wont to swell like round and orient pearls,
> Stood now within the pretty flow'ret's eyes."

Dr. Wells is worthy of a noble tribute, and his memory and character have received it at the hands of Professor Bartlett.

THE BANDAGE IN ITS APPLICATION TO FRACTURES, ETC.

In our notice of Dr. Stone we promised an essay on the bandage, and it was prepared for this number, but we have been compelled to postpone its publication until February.

A PRACTICAL TREATISE ON THE DISEASES OF CHILDREN, BY D. FRANCIS CONDIE, M. D. THIRD EDITION, REVISED AND AUGMENTED. LEA & BLANCHARD. 1850.

We are glad to see that the merits of this valuable work which we noticed at length on the publication of the first edition, have been so correctly appreciated, that a new edition, revised and augmented, has been prepared to meet the demand. The work is one of much ability, and is worthy of the confidence of the profession, and as such we commend it to their attention.

THE REVIEWER OF PROFESSOR DUDLEY'S SURGICAL ESSAYS.

We are compelled to defer the response to the editor of the Transylvania Journal of Medicine, by the reviewer of Professor Dudley's essay on aneurism, whose review appeared in the November number of this Journal. This response shall appear in our next number.